No. 12.] [October, 1878.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—THE MUSCULAR PERCEPTION OF SPACE.

THE intuitive school, Hegel alone excepted, have always held with Sir William Hamilton, that it is "truly an idle problem to attempt imagining the steps by which we may be supposed to have acquired the notion of extension". Yet it is precisely this problem that, during the last few decades, has become the centre of all psychological investigation. In this new direction of thought is involved, to some extent, a change of philosophical base and method. So suggestive are the new facts which have already crowned its researches, that the growing school of Ideal-realism begins to hope for an entire re-statement, if not indeed a partial solution, of the *Wissenschaftslehre* itself. Reacting from the world-bestriding generalisations of the system-builders of the heroic age of German philosophy, and working with a true analytic microcosmic zeal, more to be expected under the influence of Berkeley than of Kant, and none the less truly philosophical because led by specialists, the new method has at least impressed one wholesome moral. Henceforth philosophers will beware of such words as 'simple,' 'immediate,' 'necessary,' 'ultimate,' on the one hand, and 'inconceivable,' 'impossible,' 'unknowable,' on the other, as applied to any forms or products of thought.

Every muscular contraction, with which the most rudimentary known psychic elements of space-perception appear to be

somehow connected, consists of a very complex train of material changes. Which of these give rise to the feelings of fatigue and tension, and to the knowledge of the position of our limbs? Some have believed these sensations to be due largely to the skin. Van der Kolk observed that when a mixed nerve sent motor fibres to a muscle, it very often sent sensitive fibres to the overlying skin. Schiff* ascribes muscular sense, in part, to the pressure of the belly of the contracted muscle upon the inner tissues of the skin, its stretching and the friction of its moving ends against surrounding softer membranes. Even rheumatic pain, according to Schiff, is seated in morbidly sensitive cutaneous nerves. The movements of the eye are brought to consciousness by nerves surrounding the bulbus. Folding, stretching or pressing the skin near the joints gives rise to sensation of motion in the limb. Leyden† observed that if the skin was fully etherised, although difference in weights could be estimated with great accuracy, there were motor disturbances, arising, no doubt, chiefly from a diminished sense of position in the limbs. On the other hand, Bernard‡ stripped the skin from the limbs of a frog, and found its powers of swimming were not affected for some time, till, owing to the action of the water, the irritability of the muscles and the excitability of the nerves were lost together, while, if the sensitive roots of the sciatic nerve are cut, all the animal's movements become immediately ataxic. Again, it is urged by many physiologists that the Pacinian bodies, lying abundantly as they do about the joints, with the delicate leverage of their capsules, may give us no inaccurate knowledge of the position of our limbs, and even the tension of our muscles. It is quite possible that they contribute to muscular sense, but that they do so only incidentally we may infer from the fact that they are found in the mesentery and along the intercostal nerves where they cannot have this function, and from the general mode of their distribution and the degree of their sensitiveness.

That touch and muscular sense are very intimately connected in every form of animal life, and that the former often acts vicariously for the latter must be fully admitted. The skin is also very sensitive over those parts which admit of the greatest variety and freedom of motion. But that no kind of cutaneous manipulation can give rise to any kind of muscular sensation, almost all observers are agreed. The points where the skin is most sensitive to discrimination of pressure, the forehead, lips, cheeks, &c., are by no means those where muscular sense is most acute. Weber concluded that we could distinguish differences of $\frac{1}{4}$ in weight, and only of $\frac{1}{3}$ in pressure upon the skin, but it

* *Muskel u. Nervenphysiol.* pp. 156, ff. † *Virchow's Archiv*, Bd. 47.
‡ *Physiol. du Système Nerveux*, I., p. 251.

may be safely said that, although others have reached quite different results, no one has yet entirely eliminated elements of touch from experiments upon muscular discrimination, whether produced by active or passive movements.

Some investigators, especially Wundt,* make the chief elements of muscular sense central instead of peripheral, ascribing it to a feeling of innervation. We have a more or less immediate sense of force, it is said, the various degrees and directions of which are distinguished and also associated with experiences of different kinds of movements, and which perhaps, if it be volitional, is directed by an ideal representation of the movement intended, and of which, after it has been executed, we receive more or less accurate tidings from the sense of touch; while, from the time which intervenes between the act of will and the resulting modifications of peripheral sensation, farther details of tension, resistance and rapidity of motion are inferred. The hypothesis of a feeling of innervation, as an ulterior explanation of most, if not all, of the facts of physiological psychology, we regard as marking one of the most important epochs in the history of philosophy. Even as crudely conceived by Schiff, it is a constant function of muscular sense, which nevertheless contains elements quite as specific and distinct as sight itself, and conditioned directly by the state of the muscular fibres. Reserving for the present the discussion of this point, we will only mention here the important experiments of Bernhardt,† who found that we could distinguish weights nearly as well when the muscles of the arm were contracted by electricity as when they were stimulated by the will, and the fact that even the pains of cramp, tenesmus, colic, &c., which have no conscious innervation, are not only felt but are of very distinguishable degrees of violence, as, for instance, in the peculiar case of hemicrania, which long ago led Du Bois-Reymond‡ to assume the existence of sensitive fibres between those of the muscle and irritated by them.

When we remember how constantly sleeping or waking consciousness is modified by the state and action of the visceral organs, and then reflect that the muscles constitute about one-half the bulk of the entire human body, and that, according to the computation of Helmholtz, one-fifth of all its energy, measured by foot-pounds, goes out in muscular work, we may fairly claim, without exhausting the method of exclusion with all its asserted proxies and auxiliaries, that the presumption is strongly in favour of a special muscular sense. More recently, however, its existence has been placed almost beyond doubt by

* *Physiologische Psychologie*, pp. 288, ff. † *Archiv für Psychiatrie*, 1872.
‡ *Archiv für Anatomie*, 1874.

the classic experiments of Carl Sachs.* The anterior sciatic roots of a frog were severed upon one side and, after twenty-four hours for recovery, the animal was made as sensitive as possible by a subcutaneous injection of strychnia. In this way, even the fall of a pin upon the table several feet off, or the voice of the operator, is often sufficient to cause the reflex cramps which are to be used as indices of the irritation of sensitive nerves. Upon the motionless limb, the long sartorius muscle, chosen because its nerves are mostly near the centre, is dissected out upon an isolating plate of glass, till it is connected with the body, which is still further protected from irritation by an envelope of blotting paper, only by its slender nerve-fibre itself. Du Bois-Reymond had shown† that the strongest irritation of a motor root causes little or no effect in an animal similarly prepared. Sachs, however, found that very slight irritations, first by electricity, then by ammonia (which stimulates only muscular fibres), applied at the nerveless ends of his preparation, caused reflex convulsions over the entire body of the frog; which must therefore, in the latter case, be caused by the contraction as such. The physiological proof of the existence of centripetal or sensitive fibres in the muscle itself, at least within the perimysium, could hardly be more complete. The present writer should, however, admit that his attempts to verify this experiment have been extremely unsatisfactory. To his knowledge, indeed, it has never been done.

The anatomical proof of the existence of special sensitive fibres in muscles was scarcely less conclusive. When motor roots are cut from the spinal cord, which is their nutritive centre, very striking microscopic changes take place in the peripheral portions, which have long been observed, the precise nature of which, however, is a matter of much difference of opinion among anatomists. The fibres are first inflamed, then shrink and shrivel, becoming dull and opaque, till finally, in from four to eight weeks, all distinction of parts is lost in a kind of fatty degeneration. After the effects of such a section, Sachs studied the minute ramifications of the nerve of the same muscle, and found that two, out of about twenty of its fibres, showed no sign of the degeneration which had destroyed all the rest. These he inferred must therefore be derived from the posterior or sensitive roots. The converse experiment was far less satisfactory. This, however, should be expected. The section of the posterior roots must be made below the spinal ganglia, their nutritive centre, and it is almost impossible to make sure that some motor roots of the same muscle have not also been severed.

**Archiv für Anatomie*, 1874.
†*Untersuchungen über thier. Elek.*, Bd. II., s. 600.

Moreover, it is far harder to follow degenerate among sound fibres than the reverse. The course of the sensitive fibres may even be traced after they have joined the main trunk through its decomposing substance. And, finally, the sensitive roots after section are perhaps kept from decaying by streams of irritation from the intact motor roots, or from the muscle itself, while no such conservative influence can pass from sensitive to motor fibres. Indeed Colastine* has found that there was no degeneration of the peripheral part after severing the olfactory nerve. Sachs finally succeeded in irritating the nerve fibres singly and found that, while most caused the muscular fibres with which they were connected to contract, a few had no such power.

In 1872 Odenius, and a few months later, though independently and by a quite different microscopic method and more minutely, Sachs, traced and described these supposed sensitive fibres and found them the same for all vertebrate striped muscle. They leave the large motor trunk and, instead of ending like its roots very soon after entering the muscle in short, blunt, medullated, dichotomising stems, they soon lose the medullary sheath, and, running over long spaces of interstitial tissue, end, sometimes by turning loosely and irregularly about the outside of a primitive bundle, like a tendril, following its course for some distance, sometimes after countless dendritical branchings by being lost in the meshes of connective tissue or the sarcolemma, while sometimes, after meandering freely between, they appear finally to enter the muscular fibres themselves. These minute pale soft fibres, sometimes given off in considerable numbers, often anastomose, and seem to end in plexuses or even in irregular loops, although Sachs was rarely certain that he had found a veritable fibre-end. That he did so seems highly improbable, for mineral or acid re-agents, as he himself admits, are very apt either to destroy or fail clearly to stain fibres of less than ·001mm. in diameter. Odenius could find no real division of the axis-cylinder, which he believed with Schultze to be itself composed of fibrillæ. After losing the perineurium together with the medulla, the enclosing membrane often cannot be distinguished from its contents, so delicate is it. After their primary and secondary divisions, the course of these fibres is often marked by very peculiar round or biscuit-formed bodies, probably not gangliar in their nature, and not so much interrupting the continuity of the fibre, as springing from its sheath, though many times its diameter. Finally, it should not be forgotten, as an additional proof that these are really sensitive fibres, that they have been found to be most numerous in the muscles of the eye.

**Archiv für Anat. u. Physiol.*, 1875.

This hasty sketch of the present condition of the question of muscular sense brings us to our first enquiry, *viz.*, how do the changes caused in a muscle by motor innervation excite its sensitive fibres? If we wind a string in several spirals about the chest and inhale a full breath, it will slip about four inches for each of the coils which will be drawn slightly nearer each other, while if the string be thoroughly acoustic we can hear the muscular tone with a simple arrangement at the other end. This, like most illustrations, although it conveys a general notion of what takes place, is yet wrong in every detail as an image of the action of a sensitive nerve. The coils by which it encircles the belly of muscular fibres are extremely irregular. Often its course is parallel to them, and sometimes the direction of the coils is reversed, many minute threads passing off more or less diagonally. If these fibres stretch during contraction with the increasing diameter of the fibres they enclose, and if this form of irritation is the immediate datum of the conscious sensation of motion, then either the latter must *infer* one dimension of space from another, the motion of the limb from the swelling of the muscle, or else the inherent difference between the psychic and the neural *aspect*, or "infinitesimal event," involves at bottom that between one dimension of space and another more magnified. The same would also be true of fibres running transversely across a large number of muscular bundles. But the chief change is a diminution of length. In most muscles, owing to their form, this is several times the change in their diameter. Indeed, an ordinary muscle, if isolated, may often shorten three fifths of its length, while the fact that the course of a sensitive nerve is so much more extended after leaving its motor trunk than that of the motor roots themselves, indicates that it can shorten with and like the contractile wave; while if, as would seem to be the case, the motor branches end, not only more briefly, but nearer the centre of the muscle, they would have almost entire immunity from the systematical shortening. Furthermore, it seems possible, from Sachs's isolated irritations, and from the gradual increment of the first stage of ascent in the muscle-curve, that the waves of contraction in the different fibre-bundles do not actually coincide, some fibres beginning to contract a little before and some a little after the instant when the index rises from the abscissa-line on the revolving cylinder. Thus, in case of a nerve in contact with both a pre-punctual and a belated contractile fibre, the intensity of the above mode of irritation would be vastly increased.

These then are the psycho-physical factors of what we shall call the *first* muscular sense. We have seen motion in the terminal organ directly transferred to nervous elements with less

change than a sound wave undergoes in being reproduced in the nerves of Corti's arches, or on the recording cylinder of a phonograph. It is from such neural modifications that we get what Bain somewhat inaccurately calls the "sense of range". We may weight or fatigue our hand, or force it into any unnatural position, and yet we can make a dozen marks with a pencil, of any prescribed length, with nearly as much accuracy as in the natural way, so thoroughly is this sense intellectualised or abstracted from other muscular feelings on the one hand, and from the more immediate sensation of shortening fibres on the other. That it is isolated from the former, we regard as one of the most conclusive proofs that innervation is as inadequate to account for the details of muscular sense or feeling, as a father's account of the time and amount of remittances would be as a record of his son's expenses.

Careful measurements with muscles immersed in fluids have shown that they undergo a diminution of volume amounting to about one thousandth of their bulk during contraction. As they are composed of three fourths water which the greatest pressure can reduce only about five hundred-thousandths, it is evident that there must be considerable change in density of their substance. This is easily felt in the hardening of contracted tissue, and varies with the degree of tension or resistance, rather than with the amount of shortening, and may be approximately measured by increased blood-pressure. Any such change would of course be greatly augmented along the crest of each wave of contraction, near the contractile elements; and, in a substance where every tissue must be more or less strained, as the fluid conformed to the law of hydrostatic pressure, those that were softest would suffer greatest change of form. Along the track of the sensitive nerves, apparently attached to their sheath and not interrupting their course but easily slipping over their surface, are the oval or spindle-shaped bodies* above mentioned. They appear enclosed in a hyaline coat, and with a semi-transparent, granular, rather than cellular, content. The finer structure of these pads, although they are very large compared with the fibres they enclose, is entirely unknown. Now may they not be analogous to the tactile corpuscles in structure, though adapted here in the centre of the muscle to respond not so much to contact as to pressure? Sensitiveness to weights when lifted follows the same psychophysical law as weights estimated by cutaneous pressure, with this remarkable coincidence. At the lower end of the former series, up to three hundred grains, Fechner found an increase of discriminative sensibility, which he was entirely unable to explain, except by suggesting an analogy

**Archiv für Anatomie*, 1874, pp. 666-7.

with the immense increase of sensitiveness near the threshold of the touch-scale, known as the phenomena of tickling,* where, up to a certain point, mechanical compression of the terminal substance diminishes sensibility. Farther than this, both alike are inexplicable. If we suppose that, in a free unloaded contraction, a less number of fibres actively shorten than when there is great resistance to be overcome, then the number of these bodies irritated as well as the intensity of their irritation may help our discriminations doubtless in the perception of weight far more than in feelings of range or fatigue. How independent this *second* muscular sense is, appears in the fact that it makes no appreciable difference in the accuracy with which we discriminate two weights, whether we lift them through five or through twenty inches, or, within certain limits, whether we are fresh or fatigued. It is to this sense mainly, that we owe the conception of force, the origin of which empirism could never otherwise explain. If the first muscular sense gives us the data for the perception of empty space, it is this which makes possible the knowledge of matter as occupying space, resistant, acting upon us. Though less endurable, recoverable and independent of the actual presence of objects than the "sense of range," it is perhaps no less susceptible of culture, as we may see in the familiar case of the postman who judges with great accuracy whether a letter weighs more or less than half an ounce.

That the above are the respective physical conditions of the two spacial sensations of muscles is made still more probable by the fact that all other known changes in a muscle during contraction either lack the necessary degree of concomitancy, or else the interval between the threshold of sensation and that of pain, in which every kind of perception is lost, is too narrow to be assumed as a basis of such wide ranges of sensation. Heat, for instance, is mainly produced during muscular contraction, but no degree of heat or cold, even though causing the muscles to slightly stretch or shorten,† awakens any sense of motion or resistance. Even the skin which is exposed to far greater ranges of temperature can discriminate differences of only about half a degree. The amount of heat produced by muscles is not a measure of the work they do.‡ It is given off more rapidly with the same amount of rise near the summit than at the base of the muscle-curve.§ Whether, then, all the nervous and other forces causing contraction become heat on their way to external work or not, has no more to do with the sensation of the latter form of motion than with the action of polarised light on the cross-plates. Here, at least, there is no reason to believe we

* *Psychophysik*, I., pp. 182, ff. † Samkowy, *Arch. f. d. ges. Physiol.* IX.
‡ Fick, *Beiträge*, § 156. § Nawalichin, *Archiv f. d. ges. Physiol.* XIV.

infer molar from a feeling of molecular motion. The same may be said of acids and other products of decomposition, which, by acting on the almost naked axis-cylinder of the assumed sensitive nerves, probably cause the sense of muscular fatigue. This feeling is, no doubt, clearly correlated with that of innervation, but our judgment of motion or weight, instead of conforming to the curve of fatigue, is, up to a certain limit, scarcely affected by it, while, if the sensitive data were the ratio between processes or products of nutrition and retrograde metamorphosis, then again the psychic verdict in any given case would be either infinitely complex or else fluctuating with every change in its physical basis. So, too, of the more painful and undiscriminating muscular feelings, such as excessive fatigue, cramp, &c. Whether these are located in the tendons, as Wundt believes, or depend upon the extent of grey tissue involved in their conduction, as Burkhardt conjectures, or, as many anatomists suppose, are caused by lesion of tissue or of nervous anastomoses in interstitial tissue itself, or by mere excess of the same causes as in normal activity give us true muscular sensations, it is enough to assert their undisputed psychic independence in kind.

Finally, we may add that, while the latest anatomy of muscular fibres suggests the presence of yet more ultimate nervous elements peculiarly adapted to irritation by tension and pressure, our conclusion is not likely to be affected by any solution of such outstanding questions of myophysics as the pre-existence of muscular currents, the presence of a parelectrotonic layer, the number and nature of cross-discs, &c. Gerlach* believes that the fields of Cohnheim, which are light-coloured demarcations of primary bundles of muscular fibrillæ seen by cross-sections, are due to nervous substance which must be conceived as spread over the single sarcous elements as a perfect sheath. Engelmann's† ingenious theory assumes that the anisotropic or doubly refracting substance is the seat of contractile power, and acts by filling itself with fluid to three or four times its former bulk, while he has observed the isotropic substance to shrink and shorten, sometimes as much as 85 per cent., the former growing bright while the latter is growing dark, thus accounting partially for the homogeneous mid-stadium of Merkel. Such changes are far greater than those which take place in the fibre as a whole, and if these are immediately recorded upon sensitive nervous tissue it must be by pressure and tension as before, but vastly augmented, and still furnishing the required extensive and intensive series.

Muscular sense is thus absolutely unique in that the

* *Berlin. Klin. Wochenschrift*, No. 45.
† *Mikroskopische Onderzoekingen*, II., 2.

incommensurability between the form of external excitation and subjective sensation found in every other sense does not exist here. It is the motion of the limb, the muscle, the nerve-end itself, which responds by the feeling not of heat, light or sound, but of motion again. This sense is not a mere sign of some unknown *Ding an sich*. Movement, as perceived directly by consciousness, is not even found heterogeneous in quality when perceived indirectly by the special senses of sight and touch. No degree of subjective or objective analysis, though it may simplify and intercalate any number of forms, can change its essential character as motion. This, together with its ento-peripheral nature, gives it a high degree of non-inferential immediacy, *à priori* to the action of any special sense. We can thus strictly say of muscular activity, what Schopenhauer* asserted of our knowledge of the whole body, though in a much stricter sense than his.

In man the muscular sense is only rudimentary. Its sensitive fibres are best studied in the lower vertebrates. Before and during the development of sight and perhaps touch, which have largely superseded it in man, it must have played a very important part as the chief sensation of animal life. If we assume a nervous system, made of relatively simple arcs and centres, a reflex act would originate with the irritation of a sensitive fibre. This might be very slight; whether or not the fibre itself add to the intensity of the irritation, the ganglia through which it passed would augment the disturbance, and the contraction of the muscles at last, besides being an explosion far greater than can be explained by the amount of irritation, would also, in the lower forms of life, modify, or perhaps even convulse the organic processes of circulation, digestion, &c. Thus we may conceive that the first sensation would rise above its threshold, out of the general reverberation of nervous shocks and pulses, during the muscular crisis of a sensori-motor process. The sense of motion was probably the first as well as the most immediate of all the senses which we have or can directly reproduce.

The experiments of Exner† tend to confirm this view. He found that the direction of a moving point of light could be seen in less than the smallest interval of time that could be distinguished between two successive points of light, in different parts of the retinal field. There is an interval where, while each spark is seen in its place, motion is seen between them, as if one would spring over to the other, and only from the direction of this motion can it be inferred which spark appears first. More-

* *Welt als Wille u. Vorstellung*, I., § 18.

† *Wien. Sitzungsberichte* Bd. LXXII. 3, and *Pflüger's Archiv*, 1875-6.

over, the peripheral retina often sees motion as such with hardly any perception of form or brightness. This is partly cause and partly effect of its feeble localising power. This quality of the eye is more and more pronounced as we descend the scale of animal life, till we reach the faceted eye of insects which see almost nothing but motion; their vision being, as he concludes with Müller, mosaic, while the refractions of the anterior media are so confusing as to deprive them of any adequate perception of form. Certain kinds of motion, he believes, have negative after-images. From this he concludes that the eye, so to speak, tends to see successive impressions as motion where none really exists. Vierordt,* also believing that motion is not a perception but an immediate sensation not implying any inferential knowledge whatever of time and space, enumerates a number of false sensations, persisting against adult insight, which he regards as accidentally uncorrected residua of primitive and pure sense-impressions. If, *e.g.*, we move the little finger to and from the rest, the latter seem to move; if we draw the point of a stick across the back of the hand while the arm is extended and unsupported, the hand itself seems to move against the stick; if we hold the end of the finger motionless against the forehead and shake the head, the finger seems to move, &c. The content of these motor feelings is far different from the developed form of actual or visual space. It is a mere *nicht-zusammenfliessen* of the yet more elementary series of sensations of which they are indissolubly composed, while both rest and punctuality are inferences. It only remains to trace the process by which the child comes to objectively interpret and measure these vague and isolated motor feelings. The author thus postulates a nativism which grants not only that there is nothing spacial in the intellect which was not first in sensation, but also that sensations may themselves be indefinitely compounded of psychic minima, each, however, having the spacial *quale*.

But it is not merely in these lower and exceptional forms, or even as dependent upon sensible muscular fibres, that motor feelings exist. While out of the sensations of pressure and tension which follow arrested motion, arises perhaps the first rudimentary perception of an external world, developing from general epiperipheral feeling into the special senses with ever-increasing discriminations and extraditions,—reactions also, increasing in complexity, specialty and seriality, have not ceased to respond, in a generic and diffused way, to every changing shade of sensation.

It is probable that there is a constant influx of nervous energy —

* '*Zeitsinn*,' 1868, and *Zeitschrift für Biologie*, XII.

into the muscles.* In reading Hermann's ingenious experiments, it is impossible not to be impressed with the fact that the current he fails to observe may either be so weak or so absorbed by inner work as to elude his most delicate measurements, just as supposed electrical changes in nerve-fibre concurrent with sensation are far beyond the reach of any galvanometric test. If there is a pre-existent constant current in the muscles, it is thus probable that it enters along the highly conductive nerve-tracts, as the electrical organs of fishes are charged from the terminal plates. Again, although it is proven that under certain circumstances nerves may conduct both ways, and that sensitive and motor functions may even be exchanged, there are abundant indications that centripetal and centrifugal functions are never indifferent. In glands, which in many respects are similar to muscles, regular electrical functions have been proven, indicating that stimulation from the nervous centres is constant.† The fact that, of two nerve-muscle preparations, the one with the longer tract of nerve attached dies first, seems best explained by assuming some sort of current from the nerve flowing into and exhausting the muscle below the extremely variable threshold of contractile excitation. The fact of muscular tonicity then is best explained by assuming such a current identical, or more probably concomitant, with electrical changes.

This motor innervation, commonly perhaps rising to changes of muscular tension, responds to every variation of sensation. Thus we may explain the great increase of blood-pressure following the irritation of sensitive nerves.‡ How irrepressible such reflexes are, is best seen in the subtle muscle-language of gesture, facial expression, inflexion, &c. How wide a range they have had in the past, we see in imitation and pantomimic speech, and perhaps in the animism of primitive races who imitate the movements and forms of external objects till, by a vivid imaginative transference, inanimate things seem living beings like themselves. How unconscious it may be, we can infer from "planchette," table-tipping, the divining-rod, &c. How minutely and accurately these changes may be perceived even in others, may be seen in the phenomena of mind-reading, and the game of "blindfold seek,"‡ as well as in automatic gestures of all sorts. How impossible absolute immobility is in tonic muscles, may be seen in fixating a star of small magnitude, which we shall find to twinkle more and more obviously because attention has made the muscles of the eye more tense and therefore more tetanic, so

* Bain, *Senses and Intellect*, § 25.
† Rosenthal, *Muskeln u. Nerven*, pp. 208. ff.
‡ See Carpenter's *Mesmerism and Spiritualism.*

that the eyeball swerves as the phases of their vibration interfere and coincide, the ray falling now on, now between, the sensitive elements of the retina. For such a protocol of facts—to which we might add those diffused sensations which give us knowledge of the position of our limbs, the feeling of general muscular vigour or languor, the soothing sense of rest and we know not how many more, very low in the scale of ideal recoverability, of specific qualitative character and localisation—every punctual or non-spacial theory of the soul affords no rational heuristic. Colours and tones would mix, as Fechner well urges, were it unextended. Neither can we call the brain alone the organ of mind. We could rather believe with Professor Bowen in "the omnipresence of the thinking self, one and indivisible in the whole organism".

The Association-philosophy has taught us how indissolubly the terms of a psychical synthesis may be welded together till what is in fact the result of generations of training or experience appears simple and innate. *Abiunt studia in mores* is the formula of all mental growth. It is the very law of intelligence as of nature to conceal or destroy the stages of its own development by consolidating and then relegating to lower centres long processes once conscious, so that the psychologist is confronted not merely by missing links but by what seems an impassable chasm between the phenomena of matter and those of mind. It is the converse of this process, however, which we hold to be of prime importance for the theory of space-perception. As what was once a conscious act may now have become secondary-automatic, or even reflex, so what was once a pronounced muscular effort, semi-convulsive it may be in intensity, is now abridged to a mere form of motor-ideation, the neurosis of which is an innervation perhaps below the threshold of every form or degree of muscular contraction or tension. It seems not impossible, as we shall see later, that this abridgement or repression or elimination of provincial or eccentric co-operation may be carried so far as to be quite independent of the existence of muscles concerned. "The degree of consciousness is inversely proportional to the amount of external diffusion in action."*

In accordance with this are the well-known views of Hughlings Jackson,† that the units or substrata of mind are sensori-motor processes. In reproducing a word in consciousness, *e.g.*, not merely the auditory but the articulating centres are concerned. Not merely are all visual impressions in fixed association with certain ocular motions, but our idea of an object, as a ball, however indistinct, is made up of impressions of surfaces

* Ferrier, *Functions of the Brain*, p. 286.

† *Clinical and Physiological Researches in the Nervous System*, I.

and ocular adjustments. As our ideas of the primary qualities of matter, size and form, are acquired only by motions, motor centres must act if we see or think of material objects, while sensations alone are known only indirectly, and can give us but the secondary properties of matter. Bain asserts that in everything that concerns visible movement and form the muscle-consciousness is the inseparable element, while Lewes concludes that every psychical fact is a product of sense, brain and muscle-work. Wundt lays essential stress upon the fact that attention involves motor activities,* while Ferrier's experiments may be said in a general way to have identified the centres of consciousness and of motion.

How inexpugnable motor elements are from what we are wont to regard as the simplest sensations, almost countless optical experiences, beginning for instance with the Donders-Listing laws, might be cited to show. Helmholtz† argues that the mind neglects and loses in its development every element of sense-perception that it cannot utilise in the knowledge of external objects, especially intensity, which is inversely as perception, so that a pure sensation can only be brought to consciousness by ingenious artificial means. All possible *truth* is practical. To ask whether our conception of chair or table corresponds to the real chair or table apart from the uses to which they may be put, is as utterly meaningless and vain as to inquire whether a musical tone is red or yellow. No other conceivable relation than this between ideas and things can exist. *The unknowable is what I cannot react upon.* The active part of our nature is not only an essential part of cognition itself, but it always has a voice in determining what shall be believed and what rejected.

Thus at length we are brought to our first thesis, which is that, on the basis of such researches as have been enumerated, we are now warranted in assuming that every sensation of motion is itself spacial. The burden of proof indeed now lies with those who assert that, because space is the logical *prius* of motion, it is added to or imposed upon non-spacial sensations as an intelligible form by the mind. It will at least be evident why we claim for the psychologico-genetic aspect of the space-question absolute precedence over the metaphysical. It is true that space by no means implies or necessitates motion, but it is impossible even for an adult analytic mind to conceive of motion without space. The feeling of motion we have shown is the simplest, earliest, most universal, known psychic rudiment of animal life. It is distinguished from every other sensation in being identical with its objective cause or aspect, which is also

* *Physiol. Psychol.*, p. 793. † *Physiol. Optik*, pp. 431, 443.

motion. That motion felt is not the same as motion seen is of course admitted. The external existence of what is imaged on the retina as a moving limb is far more indirect and inferential than the relatively immediate muscular sense of that motion. A state of rest in our own body or in external things, the perception of any defined and static form whatever, and, most of all, the very possibility of unspaciality or punctuality must be subsequently inferred as negative instances from indeterminate extension and movement. These indeed, for an elementary consciousness which rises above its threshold only during crises of bodily activity, would be nothing more or less than abstract transcendental deductions.

A man moves his foot, and the impression of swelling, shortening fibres is transmitted through five feet of nerve-fibres to a sensitive point in the brain, and there we may suppose the motion of the foot, in an entirely different plane and dimension of space, is inferred. But, if we may imagine any first sensation to arise in some simpler form of animal life, it would be there unrelated and alone in its new, vacant, but conscious horizon. It could have no quality even of pleasure or pain, no reference to anything before or after; for these imply comparison and relation. There would be only a vague area of nerve-muscle substance, feeling its own motion as it moved. Its changes of form would be isomerically identical with its change of state. No matter whether we regard the psychical factor as the centralisation of a more diffused sentiency about the seat of greatest or more heterogeneous changes, or conceive the whole body made a sensorium by a sudden multiplication of disturbance or shocks, extending to its more and its less stable molecules alike. The materialist might prefer to say the molecular registers or "perceives" its molar equivalent of motion, as, *e.g.*, heat registers foot-pounds. We however choose to say that the soul-life, whatever its nature, begins, so far as its origin has yet been traced, in contractile tissue, and that, before discriminating parts, form, limb, position, occupied from unoccupied space, or even an external from an internal world, it has an intuition of undefined extension more absolute and immediate than any other. There is a reciprocity, a direct envisagement, a dialectic indifference, in fact, of organism and intellectual function. If subject is not one with object at some point in primordial space-perception it must remain eternally divorced from it in all the derived unities of external perception or reason. Here alone, though in a spacial respect only, subject, as it were, concurs with, is coincident with, pervades object. They are not yet distinguished or drawn apart, each by its own different cohesions and associations with members of their own series, until, though primarily

of the same essential nature, each becomes more and more exclusive of the circumscribed aggregate of activities which makes up the other.* Each may here be conceived as indifferently content and background to the other.

If there is an unbroken succession of nervous changes as a material condition of sensation, no matter how variable the ratio between the two, then spaciality is as inseparable an attribute of motor feelings as of force or matter. This *tertium quid* of equipollency postulated at some point in the history of organic life is indispensable for any psychological theory of the origin of space-perception which establishes at the same time its objective validity.

That there can be no pre-spacial motor feeling, that, just as all knowledge becomes sensation when viewed from a higher standpoint, so muscle-sensation contains an element of cognition of its own bodily substratum, in which certainty may be almost inversely as exactness, we may now assume as evident. It is also plain that the primitive and generic form of sensation just characterised, in which we believe the full solution of the space-question to lie, as it were, pre-formed in embryo, must be evanescent. New sensations would follow arising from new relations. Comparison and repetition would add intensive quality to the mere sense of formless extent. Instead of being only empty forms of self-assertion, experience and elaboration would make them into signs of external activities. As conducting fibres and sentient cells become more distinct and more numerous, psychical life, which we may conceive as beginning in muscular substance, would retire from muscle to nerve and from nerve-fibres to nerve-cells, or rather ascend and unfold in these more special organs. Almost every property possessed by nervous is now found in muscular tissue, and *vice versâ*. Hermann† finds slight electrotonus in muscles, and Tschirjew‡ has proved their independent irritability and also that nerves like muscles are irritable transversely. Both exhibit like phenomena of pulses of negative variation. With two or three exceptions, partly explicable on mechanical grounds, all poisons act on them similarly. Hällstén believes the axis-cylinder to consist of protoplasm capable of a peculiar wave-like motion. Over against these analyses the chief difference, besides that of bulk, appears to be that the active elements of nerves are inclosed in relatively thicker and more resistant substance which fits them to conduct isolated currents of disturbance, while in muscles the interstitial tissue is relatively flexile and conforms to the motion of the active elements, causing contraction.

*See Spencer's *Psychology*, Vol. I., Part ii., ch. 1. † *Pflüger's Archiv*, VI.
‡ *Archiv für Physiologie*, 1877.

Be this as it may, suppose all sentiency relegated from muscles to the nervous system alone,* and irritability and sensibility distinguished and separated. Even then we might, if disposed, fall back on Brown Séquard's† assumption that, because the length of the twitch of the secondary muscle is increased by overloading the first, muscular sense must be caused by negative variation; or we might with Gubler, who regards recurrent sensibility as a reflex phenomenon, prefer to assume a nervous circuit completed peripherally by intermediate cells, like the grey matter of the spinal marrow diffused and dissociated.‡ A complete neural circulation, however, is by no means the necessary condition of a sensibility independently located in eccentric portions of the human body such as Mr. Lewes supposes. It is of course possible that sensation accompanies the isomeric wave as it runs through the fibres, but it is certainly no less probable that it accompanies the chemical changes thus caused in central cells. If the hypothesis of specific sensibility assumed also uniformity in the centripetal wave and its rate, and if sensation occurs only in cortical cells, then they could of course be distinguished only by local signs minutely differentiated over the three hundred square inches of grey substance upon which their irritations were projected. But it is far less probable that sensation is thus immediately and discriminatively cognisant of molecular neural processes, than that the inseparable motor impulses which attend every form of external stimulation is the immediate cause or object of sensation. Wundt has shown how every form of reflex reaction is strongly inhibited by attention; but that the incipient motor impulse, though repressed, is never wholly eliminated, is no less certain. If the connexions between sensory cells are excited, activities chiefly inhibitory are caused. Inhibition, however, is not the destruction but the storing-up of energy, and is attended not by the discharge but by the increased tension of relatively large and strongly acting motor cells, whose connexions with each other are mainly summative.§

The conclusion which we thus reach harmonises in the main with the deductions of Trendelenburg, though we cannot see more than an analogy between the movement of thought and material motion; and though we can by no means admit that space is primitively inferred as a mere external condition of motion, yet it is certain that all attempts to derive or construe motion into non-motive terms are idle. Movement explains all things. Molar is explained by molecular, known by hypotheti-

* Lewes, *Problems of Life and Mind*, 2nd Series, p. 221.
† *Lectures on the Physiol. and Pathol. of the Central Nervous System.*
‡ See Vulpian's *Système Nerveux*, pp. 144, ff.
§ See Wundt, *Mechanik der Nerven*, 2te Abth., s. 133.

cal motion, while motion, by which all things are known, must itself be self-known.*

In fine, then, we believe it demonstrated, in a sense far more fundamental than that conceived by Bain, that empirism is no more able to explain space than force without muscles, that sensitive elements of contractile tissue constitute the peculiar organ of a space-perception *à priori* to the experience of the special senses, and which it is theirs to elaborate externally and measure each in its own typical way. If this be true, physiological psychology is already able to challenge the dogmatic dualism of the scientific school of metaphysicians, who, assuming with Prof. Tyndall that the essential principles of nature are already discovered, assert two series of events, each of the innumerable terms of which is at the same time indissolubly mated yet absolutely incommensurate with a corresponding term of the other series. This mild and ancient artifice, instead of two, might have given us five worlds. If we assume the touch of two smooth substances to be respectively a right and a left hand spiral motion, and the taste of two to be in the one case an acid, in the other an alkaline reaction, and so on with all the senses, there is a five-fold incommensurability. Instead of one there are five impassable gulfs with no conceivable relation among them save that of empirical association. Even so far as it is a matter of belief, we prefer to plight our allegiance to a program of work yet to be done though it were far more indefinite than it is, rather than to face a blank wall of nescience whereon no other record can be read than that there the limits of individual development or culture were mistakenly and arrogantly asserted to be the limits of possible knowledge. Psychology is no longer content to hold belief in an external world as a mere act of faith or opinion. She postulates an ultimate Monism, and hopes one day to prove a rightful title to the bold nomenclature of the Identity-philosophy. Now, with true Socratic irony, she dares to take for the most part the attitude of ignorance towards an absolute philosophy, and a yet more absolute science. Whether she will disclose the Messianic function and gladden the long travail of thought by new-dispensing the transcendent secret of reason incarnate in organic life, the future alone can tell.

G. Stanley Hall.

* *Logische Untersuchungen*, Bk. I., cc. v., vi.

II.—EDUCATION AS A SCIENCE. (IV.)*

I NOW proceed with the review of the Emotions, as motives in Education.

Play of the Emotions of Activity.

Nothing is more frequently prescribed in education than to foster the pupils' own activity, to put them in the way of discovering facts and principles for themselves. This position needs to be carefully surveyed.

There is, in the human system, a certain spontaneity of action, the result of central energy, independent of any feelings that may accompany the exercise. It is great in children; and it marks special individuals, who are said to possess the active temperament. It distinguishes races and nationalities of human beings, and is illustrated in the differences among the animal tribes; it also varies with general bodily vigour. This activity would burst out and discharge itself in some form of exertion, whether useful or useless, even if the result were perfectly indifferent as regards pleasure or pain. We usually endeavour to turn it to account by giving it a profitable direction, instead of letting it run to waste or something worse. It expends itself in a longer or shorter time, but while any portion remains, exertion is not burdensome.

Although the spontaneous flow of activity is best displayed and most intelligible in the department of muscular exercise, it applies also to the senses and the nerves, and comprises mental action as well as bodily. The intellectual strain of attention, of volition, of memory, and of thought, proceeds to a certain length by mere fulness of power, after rest and renovation; and may be counted on to this extent as involving nothing essentially toilsome. Here, too, a good direction is all that is wanted to make a profitable result.

The activity thus assumed as independent of feeling is nevertheless accompanied with feeling, and that feeling is essentially pleasurable: the pleasure being greatest at first. The presence of pleasure is the standing motive to action; and all the natural activity of the system—whether muscular or nervous—brings an effluence of pleasure, until a certain point of depletion is arrived at.

If, further, our activity is employed productively, or in yielding any gratification beyond the mere exercise, this is so much added to the pleasures of action. If, besides the delight of intellectual exercise, we obtain for ourselves the gratification of fresh knowledge, we seem to attain the full pleasure due to the employment of the intellect.

* Continued from MIND, No. XI.

Much more, however, is meant by the gratification of the self-activity of the learner. That expression points to the acquiring of knowledge, as little as possible by direct communication, and as much as possible by the mind's own exertion in working it out from the raw materials. We are to place the pupil as nearly as may be in the track of the first discoverer, and thus impart the stimulus of invention, with the accompanying outburst of self-gratulation and triumph. This bold fiction is sometimes put forward as one of the regular arts of the teacher; but I should prefer to consider it as an extraordinary device admissible only on peculiar occasions.

It is an obvious defect in teaching to keep continually lecturing pupils, without asking them in turn to reproduce and apply what is said. This is no doubt a sin against the pupil's self-activity, but rather in the manner than in the fact. Listening and imbibing constitute a mode of activity; only it may be overdone in being out of proportion to the other exercises requisite for fixing our knowledge. When these other activities are fairly plied, the pupil may have a certain complacent satisfaction in his or her own efficiency as a learner, and this is a fair and legitimate reward to an apt pupil. It does not assume any independent self-sufficiency; it merely supposes an adequate comprehension and a faithful reproduction of the knowledge communicated. The praise or approbation of the master, and of others interested, is a superadded reward.

Notwithstanding, there still remains, if we could command it, a tenfold power in the feeling of origination, invention, or creation; but as this can hardly ever be actual, the suggestion is to give it in fiction or imagination. Now, it is one of the delicate arts of an accomplished instructor to lay before his pupils a set of facts pointing to a conclusion, and leave them to draw the conclusion for themselves. Exactly to hit the mean between a leap too small to have any merit, and one too wide for the ordinary pupil, is a fine adjustment and a great success. All this, however, belongs to the occasional luxuries, the bon-bons of teaching, and cannot be included under the daily routine.

It is to be borne in mind that although the pride of origination is a motive of extraordinary power, and in some minds surpasses every other motive, and has a great charm even in a fictitious example, yet it is not in all minds the only extraneous motive that may aid the teacher. There is a counter motive of sympathy, affection and admiration for superior wisdom, that operates in the other direction; giving a zest in receiving and imbibing to the letter what is imparted, and jealously restraining any independent exercise of judgment such as would share the credit with the instructor. This tendency is no doubt liable to

run into slavishness and to favour the perpetuation of error and the stagnation of the human mind; but a certain measure of it is only becoming the attitude of a learner. It accompanies a proper sense of what is the fact, namely, that the learner *is* a learner and not a teacher or a discoverer, and has to receive a great deal with mere passive acquiescence, before venturing to suggest any improvements. Unreasoning blind faith is indispensable in beginning any art or science; the pupil has to lay up a stock of notions before having any materials for discovery or origination. There is a right moment for relaxing this attitude, and assuming the exercise of independence; but it has scarcely arrived while the schoolmaster is still at work. Even in the higher walks of university teaching, independence is premature, unless in some exceptional minds, and the attempt to proceed upon it, and to invite the free criticism of pupils, does not appear ever to have been very fruitful.*

Play of the Emotions of Fine Art.

This is necessarily a wide subject, but for our purpose a few select points will be enough. The proper and principal end of Art is enjoyment; now whatever is able to contribute on the great scale to our pleasure, is a power over all that we do. The bearings on education are to be seen.

The Art Emotions are seldom looked upon as a mere source of enjoyment. They are apt to be regarded in preference as a moral power, and an aid to education at every point. Nevertheless, we should commence with recognising in them a means of pleasure as such, a pure hedonic factor, in which capacity they are a final end. Their function in intellectual education is the function of all pleasure when not too great, namely, to cheer, refresh, and encourage us in our work.

There are certain general effects of Art that come in well at the very beginning. Such are symmetry, order, rhythm,

* It would lead us too far, although it might not be uninstructive, to reflect upon the evil side of this fondness for giving a new and self-suggested cast to all received knowledge. It introduces change for the mere sake of change and never lets well alone. It multiplies variations of form and phraseology for expressing the same facts, and so renders all subjects more perplexed than they need be; not to speak of controverting what is established, because it is established, and allowing nothing ever to settle. Owing to a dread of the feverish love of change, certain works that have accidentally received an ascendancy, such as the *Elements* of Euclid, are retained notwithstanding their imperfections. The acquiescent multitude of minds regard this as a less evil than letting loose the men of action and revolution to vie with each other in distracting alterations, while there is no judicial power to hold the balance. It is a received maxim in the tactics of legislation that no scheme, however well matured, can pass a popular body without amendment; it is not in collective human nature to accept anything *simpliciter*, without having a finger in the pie.

and simple design and proportion; which are the adjuncts of the school, just as they should be the adjuncts of home life. Proportion, simple design, a certain amount of colour, are the suitable elements of the school interior; to which are added tidiness, neatness, and arrangement, among the pupils themselves; only this must not be worrying and oppressive.

In the exercises suited to infants, Time and Rhythm are largely employed.

Of all the fine arts, the most available, universal and influential is Music. This is perhaps the most unexceptionable as well as the cheapest of human pleasures. It has been seized upon with avidity by the human race in all times; so much so that we wonder how life could ever have been passed without it. In the earlier stages, it was united with Poetry, and the poetical element was of equal, if not of greater power than the musical accompaniment. As the ethical instructors of mankind have always disavowed the pursuit of pleasure as such, and allowed it only as subsidiary to morality and social duty, the question with legislators has been what form of music is best calculated to educe the moral virtues and the nobler characteristics of the mind. It was this view that entered into the speculative social constructions of Plato and Aristotle. Now, undoubtedly the various modes of music operate very differently on the mind; everyone knows the extremes of martial and ecclesiastical music; and fancy can insert many intermediate grades.*

For the moment, a musical strain exerts immense power over the mind, to animate, to encourage, to soothe and to console. But the facts do not bear us out in attributing to it any permanent moral influence; nothing is more fugitive than the excitement of a musical performance. Excepting its value as a substantive contribution to the enjoyment of life, I am not able to affirm that it has any influence on education, whether moral or intellectual. Certainly, if it has any effect in the moral sphere, it has none that I can trace in the sphere of intellect. As a recreative variety in the midst of toil, it deserves every encomium. In those exercises that are half recreative, half educational, as drill and gymnastic, the accompaniment of a band is most

* Plato, in the *Republic*, wishing to train a vigorous and hardy race, interdicted not simply the unfavourable musical strains, but the instruments most adapted to these. He permits only the lyre and the harp, with the panspipe for shepherds attending their flocks; forbidding both the flute and all complicated stringed instruments. Disallowing the lugubrious, passionate, soft, and convivial modes of music, he tolerates none but the Dorian and the Phrygian, suitable to a sober, resolute, courageous frame of mind; to which also the rhythm and movement of the body is to be adapted. (Grote's *Plato*, III. 196.)

stimulating. In the Kindergarten it is well brought in, as the wind-up to the morning's work. But music during ordinary lessons, or any sort of intellectual work, is mere distraction, as everyone knows from the experience of street bands and organs.

Excess in the pleasures of music, like every other excess, is unfavourable to mental culture. But some of the most intellectual men that ever lived have been devotees of music. In the case of Luther it seems to have been incorporated with his whole being; Milton invoked it as an aid in poetic inspiration. These were men whose genius largely involved their emotions. But the musical enthusiasm of Jeremy Bentham could have no bearing on his work, farther than as so much enjoyment.

Poetry is Music and a great deal more. Its bearings are more numerous and complicated. In the ruder stages of music, when it accompanied poetry, the main effects lay in the poetry. The poetic form—the rhythm and the metre—impresses the ear, and is an aid to memory; whence it has been transferred from the proper themes of poetry to very prosaic subjects by way of a mnemonic device. The subject-matter of poetry comprises the stirring narrative, which is an enormous power in human life, and the earliest intellectual stimulus in education.

Play of the Ethical Emotions.

The feelings called Ethical, or Moral, from their very meaning are the support of all good and right conduct. The other emotions may be made to point to this end, but they may also work in the opposite direction.

When the educator describes these in more precise and equivalent phraseology, he generally singles out regard to the pleasure and displeasure of parents and superiors, together with habits or dispositions towards obedience; all which is the result of culture and growth.

Any primitive feelings conspiring towards good conduct must be of the nature of the sympathies or social yearnings; which are called into exercise in definite ways, well known to all students of human nature. By far the most powerful stimulus to acts of goodness towards others, is good conduct on their side; whoever can resist this, is a fit subject for the government of fear and nothing else. The law says 'Do unto others, as ye *would* that they should do unto you'. The lower ground of practice is 'Do unto others as they do unto you'. This is as far as the very young can reach in moral virtue.

It is too much to expect in early years generous and disinterested impulses, unreciprocated. The young have little to call their own; they have no means. Their fortune is their free, unrestrained vivacity, their elation, and their hopes. If they

freely give up any part of this, it is in consideration of equivalent benefits. They are susceptible of being worked up to moments of self-renunciation, in which they may commit their future irrevocably, without knowing what they are about. But they cannot be counted on for daily, persistent self-restraint, willingly encountered, unless there be some seen reward, present or in the distance. It takes a good deal to bring any one even up to the point of fair and full reciprocity of services in all things.

The Feelings as appealed to in Discipline.

The survey that has now been made of the sensibilities of the human mind available as motives, prepares for the consideration of Discipline in teaching. The instructor finds that, in school moments and for school purposes, he has to restrain all the unruly impulses, and to overbear the sluggishness of the youthful nature. To suceeed in this requirement, many arts are employed, corresponding to the wide compass of sensations and emotions that agitate the human breast.

The question how to maintain discipline among masses of human beings is of very wide application, and is therefore the subject of a great variety of experiments. In the wide field of moral control, it includes a principal function of government, namely, the repression of crime; a department that has lately received much attention. To collect all the lights furnished in each of the spheres where moral control has to be exercised, is to contribute to the illumination of each. There has, undoubtedly, in former times been very great mismanagement in almost every one of the regions of repressive authority; in the state, in the family, and in the school, in all which an excess of human misery is habitually engendered by badness in the manner of exercising control. It is perhaps in the family that the mischief is most widely spread and most baneful.

By degrees we have become aware of various errors that ran through the former methods of discipline, in the several institutions of the state, as well as in the family. We have discovered the evil of working by fear alone, and still more by fear of coarse, painful, and degrading inflictions. We have discovered that occasions of offence can be avoided by a variety of salutary arrangements, such as to check the very disposition to unruly conduct. We consider that a great discovery has been made in regard to punishments, by the enunciation of the maxim that certainty is more important than severity; to which should be added, proportion to the offence. We also consider that by a suitable training, or education, the dispositions that lead to disorder and crime, can be checked in the bud; and that until

there has been room for such training to operate, the mind should not be exposed to temptation. We have become accustomed to lay more stress in cultivating the amicable relations of human beings, all which tend to abridge the sphere of injurious conduct on the part of individuals.

The consideration of discipline in Education supposes the relation of a teacher to a class; one man or woman exercising over a body of pupils the authority requisite for the work in hand. Nevertheless, it is not lost time to advert, in the first instance, to the maxims pertaining to authority in general.

Authority, government, power over others is not an end in itself; it is but a means. Farther, its operation is an evil; it seriously abates human happiness. The restraint upon free agency, the infliction of pain on individuals, the setting-up a reign of terror—all this is justified solely by the prevention of evils out of all proportion to the misery that it inflicts. This might seem self-evident; but is not so. The deep-seated malevolence and lust of domination in the human mind makes the necessity of government a pretext for excesses in severity and repression; to which must be added the opportunity of preying upon the substance of the governed.

Mankind have had their eyes gradually opened to this state of things; the philosophy of society now endeavours to formulate the limits to authority, and to the employment of repressive severities. Not only is it restricted to the mildest penalties that will answer its purpose; but its very existence has to be justified in each case.

Authority is not necessary to every teaching relation. A willing pupil coming up to a master to be taught, is not entering into a relationship of authority: it is a mere voluntary compact, terminable at the pleasure of each. There is no more authority over the assemblies of grown men to hear lectures, than over the worshippers at church, or the frequenters of the play. There is nothing but the observance of mutual toleration and forbearance so far as requisite to the common good; if this were grossly violated, there would be an exercise of power either by the collective mass themselves, or by summoning the constable to their aid. No authority is lodged in the lecturer, preacher, or performer, to repress disturbances.

Authority first appears in the family, and is thence transferred with modifications to the school. It is between these two institutions, that the comparison is most suggestive. The parent's authority is associated with sustenance, and has an almost unlimited range; it is tempered by affection, but this depends upon mutuality of pleasure-giving, and supposes a limited number. The teacher's authority has nothing to do with

sustenance, his is a duty undertaken for payment; it is subsidiary to the single object of teaching a definite amount of knowledge; it wants the requisites of affection; the numbers are too great, and the mutual concern too restricted; but affection is not wholly excluded, and in certain well-marked cases it may play a part.

On the other hand, the family and the school have some important agreements. They both deal with immature minds, for whom certain kinds of motives are unsuitable. Neither can employ motives that are applicable only to grown men and women; they cannot appeal to consequences in the distant and unknown future. Children do not realise a remote effect, and they fail even to conceive many things that will one day have great power over their conduct. To talk to them about riches, honours, and a good conscience is in vain. A half holiday is more to them than the prospect of becoming head of a business.

The position of immaturity is attended with another peculiarity, namely, that the reasons of a rule cannot always be made apparent. Sometimes they can, if not to the younger, at least to the older children. This is a highly prized aid to obedience in every department of government.

There are many important points of agreement in the exercise of authority in every sphere—the family, the school, the relation of master and servant, ruler and subject whether in the state at large or in any subordinate societies. For example:—

(1.) Restraints should be as few as the situation admits of: the multiplication of grounds of offence is a great evil, and yet exceedingly natural.

(2.) Duties and Offences should be definitely expressed, so as to be clearly understood. This may not always be possible to the full extent; but should be always aimed at.

(3.) Offences should be graduated according to their degree of heinousness. This too needs clearness of discrimination and definite language.

(4.) The application of Punishment is regulated according to certain principles, first clearly pointed out by Bentham.

(5.) Voluntary dispositions are to be trusted as far as they can go.

(6.) By organisation and arrangement, the occasions of disorder are avoided. Quarrels are obviated by not permitting crowds, jostling, and collisions. Dishonesty is checked by want of opportunity; remissness, by the watchful eye and by definite tests of performance.

(7.) The awe and influence of authority is maintained by a certain formality and state. Forms and ritual are adapted to all the operations of law: persons in authority are clothed with

dignity and inviolability. The greater the necessity of enforcing obedience, the more stern and imposing is the ritual of authority. The Romans, the greatest law-giving people, were the most stately in their official rites. A small portion of formality should accompany the slightest forms of authority.

(8.) It is understood that authority, with all its appurtenances, exists for the benefits of the governed, and not as a perquisite of the ruler.

(9.) The operation of mere vindictiveness should be curtailed to the uttermost.

(10.) So far as circumstances allow, every one in authority should assume a benign character, seeking the benefit of those under him, using instruction and moral suasion so as to stave off the necessity of force. The effect of this attitude is at its utmost, when its limits are clearly discerned, and never passed.

(11.) The reasons for repression and discipline should, as far as possible, be made intelligible to those concerned; and should be referable solely to the general good. This involves, as a part of national education, a knowledge of the structure of society, as being a regulated reciprocity among all its members, for the good of each and of all.*

* Whoever occupies a position of authority ought to be familiar with the general principles and conditions of Punishment, as they may be found set forth in the Penal Code of Bentham. The broad, exhaustive view there given will co-operate beneficially with each one's actual experience. I make no apology for presenting a short summary of his principles.

After precisely defining the proper ends of Punishment, Bentham marks the cases unmeet for Punishment. First, where it is *groundless:* that is, where there never has been any real mischief (the other party consenting to what has been done), or where the mischief is overweighed by a benefit of greater value. Second, where it is *inefficacious:* including cases where the the penal provision has not come before the offender's notice, where he is unaware of the consequences of his act, or where he is not a free agent. Third, cases where it is *unprofitable:* that is, when the evil of the punishment exceeds the evil of the offence. (The evils of Punishment, which have to be summed up and set against the good, are (1) coercion or restraint, (2) the uneasiness of apprehension, (3) the actual suffering, (4) the suffering caused to all those that are in sympathy with the person punished.) Fourth, cases where Punishment is *needless:* as when the end can be attained in some cheaper way, as by instruction and persuasion. In this class, Bentham specially includes the offences that consist in disseminating pernicious principles in politics, morality, or religion. These should be met by instruction and argument, and not by the penalties of the law.

Under what he calls the expense or frugality of Punishment, Bentham urges the necessity of presenting to the mind an adequate notion of what a punishment really is. Hence the advantage of punishments that are easily learnt, and remembered, and that appear greater, and not less, than they really are.

Next as to the main point, the *measure* of Punishment. First, it should be such as clearly to outweigh the profit of the offence: including not simply the immediate profit, but every advantage, real or apparent, that

The points of comparison and contrast between the school and family have been noted. The more special distinction of the school, as compared with relations of authority in general, is resolvable into its main object—Instruction, for which the condition that needs to be imposed is Attention and Application of mind, with a view to permanent intellectual and other impressions. To evoke, charm, cajole, compel this attitude, is the first aim in all teaching. The hostile influences to be overcome are such as physical inability and exhaustion, irksomeness in the work, diversions and distractions from other tastes, with the natural rebelliousness of human beings under authority.

has weighed as an inducement to commit it. Second, the greater the mischief of the offence, the greater is the expense that it is worth while to be at, in the way of punishment. Third, when two offences come into competition, the punishment for the greater should be such as to make the less preferred; thus robbery with violence to the person, is always punished more severely than simple robbery. Fourth, the punishment to be so adjusted, that for every part of the resulting mischief, a motive may be provided to restrain from causing it. Fifth, the punishment should not be greater than is needed for these ends. Sixth, there should be taken into account the circumstances affecting the sensibility of the offenders, so that the same punishment may not operate unequally; as age, sex, wealth, position. Seventh, the punishment needs to be increased in magnitude as it falls short of certainty. Eighth, it must be further increased in magnitude as it falls short in point of proximity: penalties that are uncertain and those that are remote, correspondingly fail to influence the mind. Ninth, when the act indicates a *habit*, the punishment must be increased so as to outweigh the profit of the other offences that the offender may commit with impunity: this is severe, but necessary, as in putting down the coiners of base money. Tenth, when a punishment well fitted in its quality cannot exist in less than a certain quantity, it may be of use to employ it, although a little beyond the measure of the offence: such are the punishments of exile, expulsion from a society, dismissal from office. Eleventh, this may be the case more particularly, when the punishment is a moral lesson. Twelfth, in adjusting the quantum, account is to be taken of the circumstances that render all punishment unprofitable. Thirteenth, if in carrying out these provisions, anything occurs tending to do more harm than the good arising from the punishment, that thing should be omitted.

In regard to the selection of punishments, Bentham lays down a number of tests or conditions whereby they are fitted to comply with the foregoing requirements. First, is the quality of *Variability:* a punishment should have degrees of intensity and duration; this applies to fines, corporal punishment, and imprisonment; also to censure, or ill-name. Second, *Equability*, or equal application under all circumstances: this is not easy to secure; a fixed fine is an unequable punishment. Third, *Commensurability:* that is, punishments should be so adapted to offences, that the offender may clearly conceive the inequality of the suffering attached to crimes of different degrees of heinousness; this property can be grafted on the variable punishments, as imprisonment. Fourth, *Characteristicalness:* this is where something can be found in the punishment, whose idea exactly fits the crime. Bentham dilates upon this topic, in order to discriminate it from the old crude method of an eye for an eye; cases in point occur abundantly both in the family and in the school. Fifth,

The arts of proceeding are not the same for a single pupil, and for a class. For the single pupil, individuality may be studied and appealed to; for the class, individualities are not considered. The element of number is an essential feature; carrying with it both obstructions and aids, and demanding a very special manipulation.

It is in dealing with numbers that the teacher stands distinguished from the parent, and allied to the wider authorities of the State; exercising larger control, encountering greater risks, and requiring a more steady hand. With an individual pupil, we need only such motives as are personal to himself; with numbers, we are under the harsh necessity of punishing for example.

Good physical surroundings are known to be half the battle. A spacious and airy building; room for the classes to come together and depart without confusion or collision: these are prime facilities and aids to discipline. Next is organisation, or method and orderly arrangement in all the movements; whereby each pupil is always found in the proper place, and the entire mass comprehended under the master's glance. To this follows the due alternation and remission of work, avoiding fatigue and maintaining the spirits and the energies while the teaching lasts.

After the externals and arrangements come the Methods and Arts of Teaching, considered as imparting lucidity to the explanations, and easing the necessary intellectual labour of comprehension. If to this prime quality can be added extraneous interest or charm, so much the better; but not to be at the expense of clearness, the first condition of getting through the subject.

The personality of the teacher may be in favour of his influence; a likeable exterior, a winning voice and manner, a friendly

Exemplarity: this is connected with the impressiveness of a punishment; all the solemnities accompanying the execution increase this effect. Bentham, however, did not sufficiently consider the evils attending too great publicity, which have led to withdrawing punishments from the gaze of the multitude; it being simply intimated that they have been carried out. Sixth, *Frugality:* or making punishments less costly to the State, as when prisoners are employed productively. Seventh, *Subserviency to Reformation:* by weakening the seductive, and strengthening the preserving motives; as in giving habits of labour to the idle. Eighth, *Efficacy in Disablement:* as in deposition from office. Ninth, *Subserviency to Compensation:* as by pecuniary inflictions. Tenth, *Popularity.* Bentham lays much stress upon the popularity and unpopularity of punishments, whereby the public sympathy may work for or against the law; when a punishment is unpopular, juries are reluctant to convict, and public agitation gets up for remission of sentence. Eleventh, *Simplicity of Description:* under this head, Bentham comments upon the obscure and unintelligible descriptions of the old law, as *capital felony, præmunire.* Twelfth, *Remissibility,* in case of mistake.

expression, when relaxing the sternness of authority. This is the side of allurement or attraction; the other side is the stately, imposing, and dignified bearing, by which the master can impersonate authority and be a standing memento to the evil-disposed of the flock. It is seldom given to one man or woman to display both attitudes in their highest force; but wherever, and to whatever extent, they can be assumed, they constitute a barrier to disaffection and remissness.

Any prominent displays of swagger and self-conceit operate against the teacher's influence, and incite efforts to take him down. It is possible to temper authority with an unassuming demeanour.

Much of course depends upon *tact:* meaning by that a lively and wakeful sense of everything that is going on. Disorder is the sure sequel of the teacher's failure in sight or in hearing; but even with the senses good, there may be absent the watchful employment of them. This is itself a natural incapacity for the work of teaching; just as an orator is sure to fail, if he is slow to discern the signs of the effect that he produces on his audience. A teacher must not merely be sensitive to incipient and marked disorder; he must read the result of his teaching in the pupils' eyes.

That quietness of manner that comes not of feebleness, but of restraint and collectedness, passing easily into energy when required, is a valuable adjunct to discipline. To be fussy and flurried is to infect the class with the same qualities; unfavourable alike to repression and to learning.

Any mistake, miscarriage, or false step, on the part of a teacher, is for the moment fatal to his ascendancy. Such things will happen, and they render undue assumption all the more perilous.

The stress of the teacher's difficulty lies in the heavings of a mass or multitude. The working of human beings collectively, is wholly distinct from their individual action; a new set of forces and influences are generated. One man against a multitude is always in the post of danger. As units in a mass, every individual displays entirely new characters. The anti-social or malevolent passion—the delight in gaining a triumph—which is suppressed in the individual as against a more powerful individual, is re-ignited and inflamed in company with others. Whenever a simultaneous charge is possible, the authority of a single person is as nought in the balance.

It is often said that the teacher should get the collective opinion on his side—should, in short, create a good class-opinion. It is easier to deserve success in this than to command it. The fear is that, till the end of time, the sympathy of numbers will

continue to manifest itself against authority in the school. There will be occasions when the infection of the mass is a stronghold of order, as when the majority are bent on attending to the work, and are thwarted by a few disturbers of the peace; or when they have a general sympathy with their teacher, and merely indulge themselves in rare and exceptional outbursts. While a teacher's merits may gain for him this position of advantage, more or less, he is never above the risks of an outbreak, and must be ready for the final resort of repression by discipline or penalties. He may still work by soothing applications, gentle and kindly remonstrance; he may check the spread of disaffection by watchful tactics, and by showing that he has the ringleaders in his eye; but in the end he must punish.

It is this position of constant preparedness for disorder, sometimes in isolated individuals, and sometimes in the mass, that demands an air and manner betokening authority, and carrying with it a certain *hauteur* and distance; the necessity for which is the stronger, as the warring elements are more rife.

The discipline of numbers is impeded by two sorts of pupils: those that have no natural liking for the subject, and those that are too far behind to understand the teaching. In a perfectly-arranged school, both sorts would be excluded from a class.

The foregoing considerations lead up to the final subject—Punishment; in administering which the practice of Education, as well as of other kinds of government, has greatly improved. The general principles of punishment have been already enounced. We have to consider their application to the school. But first a few words on the employment of Reward.

Emulation.—Prizes.—Place-taking.

All these names point to the same fact and the same motive—the desire of surpassing others, of gaining distinction; a motive that has already been weighed. It is the most powerful known stimulant to intellectual application; and where it is in full operation, nothing else is needed. Its defects are (1) it is an anti-social principle, (2) it is apt to be too energetic, (3) it is limited to a small number, (4) it makes a merit of superior natural gifts.

It is a fact that the human intellect has at all times been spurred to its highest exertions, by rivalry, contest, and the ambition of being first. The question is whether a more moderate pitch of excellence, such as befits average faculties, could not be attained without that stimulant. If so, there would be a clear moral gain. Be this as it may, there is no need to bring it forward prematurely, or to press its application at the beginning. In the infant stage, where the endeavour is to draw

out the amicable sentiments, it is better kept back. For tasks that are easy and interesting, it is unnecessary. The pupils that possess unusual aptitude, should be incited to modesty rather than to assumption.

The greater prizes and distinctions affect only a very small number. Place-capturing, as Bentham phrases it, affects all more or less, although in the lower end of a class position is of small consequence. Too often the attainments near the bottom are nil. A few contesting eagerly for being first, and the mass phlegmatic, is not a healthy class.

Prizes may be valuable in themselves, and also a token of superiority. Small gifts by parents are useful incitements to lessons; the school contains prizes for distinction that only a small number can reach. The schoolmaster's means of reward is chiefly confined to approbation, or praise, a great and flexible instrument, yet needing delicate manipulation. Some kinds of merit are so palpable as to be described by numerical marks. Next, in point of distinctness, is the fact that a thing is right or wrong, in part or in whole; it is sufficient approbation to pronounce that a question is correctly answered, a passage properly explained. This is the praise that envy cannot assail. Most unsafe are phrases of commendation; much pains is needed to make them both discriminating and just. They need to have a palpable basis in facts. Distinguished merit should not always be attended with pæans; silent recognition is the rule, the exceptions must be such as to extort admiration from the most jealous. The controlling circumstance is the presence of the collective body; the teacher is not speaking for himself alone, but directing the sentiments of a multitude, with which he should never be at variance; his strictly private judgments should be privately conveyed. Bentham's "Scholar-Jury Principle," although not formally recognised in modern methods, is always tacitly at work. The opinion of the school, when at its utmost efficiency, is the united judgment of the head and the members, the master and the mass. Any other state of things is war: although this too may be unavoidable.

Punishment.

The first and readiest, and ever the best, form of Punishment, is Censure, Reprobation, Dispraise, to which are applicable all the maxims above laid down for praise. Definite descriptions of definite failures, without note or comment, are a power to punish. When there are aggravations, such as downright carelessness, a damaging commentary may be added; but in using terms of reprobation, still more strict regard has to be paid to discrimination and justice. The degrees of badness, are sometimes

numerical, as by the quantity of lesson missed, and the repetition of inattention; this very definiteness literally stated is more cutting than epithets.

Strong terms of reproof should be sparing, in order to be more effective. Still more sparing ought to be tones of anger. Loss of temper, however excusable, is really a victory to wrong-doers; although for the moment it may strike terror. Unless a man is of fiendish nature throughout, he cannot maintain a consistent course, if he gives way to temper. Indignation under control is a mighty weapon. Yet it is mere impotence to utter threats when the power of execution is known to be wanting. There is nothing worse for authority than to over-vaunt itself; this is the fatal step to the ridiculous.

Punishments must go deeper than words: indeed, the efficacy of blame depends on something else to follow. Bearing in mind what are the evil tendencies to be encountered in school discipline—want of application being the most constant—we may review the different kinds of penalties that have been placed at the disposal of the schoolmaster. The occasional aggravation of disorder and rebelliousness has also to be encountered, but with an eye to the main requisite.

Simple forms of Disgrace have been invented, in the shape of shameful positions, and humiliating isolation. As appealing to the sense of shame, these are powerful with many, but not with all: their power varies with the view taken of them by the collective body, as well as with individual sensitiveness. They answer for smaller offences, but not for the greatest; they may do to begin with, but they rapidly lose power by repetition. It is a rule in punishment to try slight penalties at first; with the better natures, the mere idea of punishment is enough: severity is entirely unnecessary. It is a coarse and blundering system that knows of nothing but the severe and degrading sorts.

Detention from play, or keeping-in after hours, is very galling to the young; and it ought to suffice for even serious offences; especially for riotous and unruly tendencies, for which it has all the merits of "characteristicalness". The excess of activity and aggressiveness is met by withholding the ordinary outlets.

Tasks or impositions are the usual punishment of neglect of lessons, and are also employed for rebelliousness; the pain lies in the intellectual *ennui*, which is severe to those that have no liking for books in any shape. They also possess the irksomeness of confinement and fatigue-drill. They may be superadded to shame, and the combination is a formidable penalty.

With all these various resources ingeniously plied—Emulation, Praise, Censure, Forms of Disgrace, Confinement, Impositions—the necessity for Corporal Punishments should be nearly done

away with. In any well-regulated school, where all the motives are carefully graded, through a long series of increasing privations and penalties, there should be no cases but what are sufficiently met. The presence of pupils that are not amenable to such means is a discord and anomaly: and the direct remedy would consist in removing them to some place where the lower natures are grouped together. Inequality of moral tone is as much to be deprecated in a class as inequality of intellectual advancement. There should be Reformatories, or special institutions, for those that cannot be governed like the majority.

Where corporal punishment is kept up, it should be at the far end of the list of penalties; its slightest application should be accounted the worst disgrace, and should be accompanied with stigmatising forms. It should be regarded as a deep injury to the person that inflicts it, and to those that have to witness it—as the height of shame and infamy. It ought not to be repeated with the same pupil: if two or three applications are not enough, removal is the proper course.

The misfortune is that in the National Schools, the worst and most neglected natures have to be introduced: yet they should not brutalise a whole school. Even when children are habituated to blows at home, it does not follow that these are necessary at school; parents are often unskilful, as well as hampered in all their circumstances, and emergencies are pressing; the treatment at school may easily rise above the conduct of the family. In many instances the school will be a welcome haven to the children of troubled homes; and lead to the generous response of good behaviour.

In point of fact, however, the children of wretchedness are not always those that give trouble, nor is it the schools where these are found that are most given to corporal punishments. The schoolmaster's most wayward subjects come often from good families; and they are found in schools of the highest grade. There should be no difficulty in sending away from superior schools all such as could not be disciplined without the degradation of flogging.*

* Testimonies are adduced from very distinguished men, to the effect that without flogging they would have done nothing. Melancthon, Johnson, Goldsmith, are all quoted for a sentiment of this kind. We must, however, interpret the fact on a wider basis. There was no intermediate course in those days between spoiling and corporal punishment: he that spared the rod hated the child. Many ways can now be found of spurring young and capable minds to application; and corporal punishment would take an inferior position in the mere point of efficiency.

It is not to be held that corporal punishment, to such extent as is permissible, is the severest form of punishment that may be administered in connexion with the school. For mere pain, a whipping would often be

The Discipline of Consequences.

The idea of Rousseau that children, instead of being punished, should be left to the natural consequences of their disobedience, has much plausibility, and is taken up at the present day by educationists. Mr Spencer has dwelt upon it with great emphasis.

One obvious limitation to the principle is that the results may be too serious to be used for discipline: children have to be protected from the consequences of many of their acts.

What is intended is, to free parents and others from the odium of being the authors of pain, and to throw this upon impersonal agencies, towards whom the child can entertain no resentment. But before counting on that result, two things are to be weighed. For one, the child may soon be able to see through the device, and to be aware that after all the pain is brought about by virtue of a well-laid scheme for the purpose: as when the unpunctual child is left behind. The other remark is that, the personifying or anthropomorphic tendency being at its greatest in early years, every natural evil is laid to the door of a person known or unknown. The habit of looking at the laws of nature, in their crushing application, as cold, passionless, purposeless, is a very late and difficult acquirement, one of the triumphs of science or philosophy: we begin by resenting everything that does us harm; and are but too ready to look round for an actual person to bear the brunt of our wrath.

A further difficulty is the want of foresight and foreknowledge in children: they are unable to realise consequences when the evil impulse is upon them. This, of course, decreases by time; and according as the sense of consequences is strengthened, these become more adequate as a check to misconduct. It is then indifferent whether they are natural or ordained.

Among the natural consequences that are relied on as correctives of misbehaviour in the family, are such as these: going with shabby clothes, from having spoilt a new suit; getting no new toys to replace those that are destroyed. The case of one child having to make reparation to another for things destroyed, is more an example of Bentham's "characteristical" punishment.

In school, the discipline of consequences comes in under the arrangements of the school for assigning each one's merit on an impersonal plan; the temper or disposition of the master being nowhere apparent. The regulations being fixed and understood, non-compliance punishes itself.

A. Bain.

chosen in preference to the intolerable irksomeness of confinement during play or after hours, and of impositions in the way of drill tasks; while the language of censure may be so cutting as to be far worse than blows. What is maintained is that these other punishments are not so liable to abuse, nor so brutalising to all concerned as bodily inflictions.

III.—INTUITION AND INFERENCE.

II. Inference.

There has never been that uncertainty and confusion in the use of the term Inference which has prevailed in the case of its companion, Intuition. There never has been serious dissent from the explanation that an inference is a proposition which is received as true in consequence of the admitted truth of some other proposition. To explore and make evident the psychological processes which constitute the act of inference is, however, a work which has not been thoroughly carried out. As a consequence it happens that the scope of the term has been rather too restricted than too greatly enlarged, and we shall not find error in the way of its improper application so much as in the failure to embrace within it much that there belongs. It will be for us to study here the nature and character of the mental process which makes inference, and see what is concerned in the act of inferring.

Our task is somewhat simplified by our ability at the outset to dismiss peremptorily the whole general division of presentative cognitions from our consideration. Intuitions are not inferences. What is apprehended presentatively, in common parlance, we *know;* we do not *infer* it. In every presentative experience there is indeed a representative element which is not intuition; but in saying that intuition is not inference I do not mean to include that constituent: *so far forth* as a cognition is presentative it is not inferential. We are hence to seek for inferences in the other grand division of cognitions. Inference must be representative cognition of some sort. Is all representative cognition inference, and are the terms convertible?

In answer to this question another may be asked, namely, whether if we were called upon to characterise representative cognition to distinguish it from any other kind, we should not invariably denominate it inferential. We have already noted the difficulties in the way of designating it as intuitional, and there seems to be a naturalness and fitness in terming such knowledge inferential. It behoves us, therefore, to examine the grounds of the appropriateness of such a designation. The matter will be elucidated by the examination of some representative cognition, as that of a picture I saw yesterday. On a recollection of it I have a cognition in my mind of which, as being present, I am conscious. Besides the consciousness of the present cognition, I know that it represents an experience I had yesterday. My mind is, so to speak, carried back to the past experience which I *infer* that I had. By the medium of a present idea the mind is carried back or over to the past

sensation. The expression 'mind is carried back' is indeed figurative, but there is no other which indicates better the character of a representation. Representation itself is unanalysable; we only know that this cognition in our minds is a second presentation, a re-presentation. The idea of a picture is not that picture, but is a copy, as it were, of the picture and known to be such. In representing the picture the mind *refers* the present idea to a past sensation which it *infers*. It cannot be said that the one is carried back any more than the other is brought forward; the process is wholly beyond the reach of further analysis, as appears probable. All that can be said is, it is different from immediate beholding.

With the representation of a cognition there will be certain judgments involved. The picture is represented, and with the representation I judge that I saw it, that it existed, &c. These judgments are all inferential; the existence in the past of what we remember is inferred by virtue of our remembering, and, in proportion as our memory of the circumstance is strong or weak, the inference is to us conclusive or inconclusive. We infer that we had certain sensations and infer the existence in the past of objects which afforded such sensations. So plain and distinctive a case of representation as that of representation of a sensation thus carries with it inference as a part of the experience, and, in fact, as constituting the same. If we take away the representative cognition, there is no inferring; if we subduct the inference, either there is no cognition at all or it becomes intuitional.

Now since the instances wherein we find the purest representation reveal inference as an essential part of the cognition, and since all cognition which is not representative is immediate or presentative, from which latter inference is always distinguished, it would seem to be clear that the act of inferring is neither more nor less than representative-cognising. Nothing more is needed to confirm this conclusion than to see whether in the progress of knowledge, in the ratio in which the representative element varies, the character of the knowledge is correspondingly inferential. The earlier parts of this essay and the expositions in two preceding essays, to which I may perhaps be allowed to refer ('Knowledge and Belief,' MIND, No. VII., 'Presentative and Representative Cognition,' MIND, No. X.), tend to make out this latter. The complexity of cognitions depends upon their degree of representativeness; and only in this complexity do we find any call for inference. We cognise through media when we infer, and the less complex and less highly integrated those media, the less inference and reasoning are conspicuous. But the media through which we cognise are representative cognitions in different stages of integration. And

given a power of representation and the processes of association of similars and contiguities, psychologists have recently shown how all reasoning is explicable. Both Mr. Bain and Mr. Spencer, as well as the two Mills, have fully developed this branch of mental activity. The processes of association are not other kinds of knowing but are the process of cognition itself, and of the growth, accumulation, and integration of cognitions. From all these considerations, therefore, we are pointed to the inevitable conclusion that inference as a mental process is identical with representative cognition.

For still further confirmation, let us dwell for a moment upon two or three examples of representative cognitions which might at first thought seem to be in no sense inferences. For example, the phrase *I had a father* would appear to be the statement of a fact, and not at all inferential. It is certainly true, the popular mind might say, that I had a father; there is no doubt of it; the expression is moreover an independent statement, not an inference from any other. In response, it should first be said that the truth or falsity, the certainty or doubt, attending a proposition do not depend upon the absence of inference; what we infer may be as true and as certain as what we intuite. I infer that, if all men are mortals, some men are mortals, and this latter conclusion is not more doubtful than my intuition of the light—indeed some would claim the certitude of the latter to be inferior. In the second place, let us see whether, even if there are no explicit premisses for the assertion, there are not some implicit. The cognition expressed by the proposition *I had a father* is a complex one, made up of sundry minor ones. Father expresses the fact of paternity, a general notion derived from various experiences. Certain events are observed to follow certain other events; an association of two individuals of opposite sex, fecundation, conception, and birth follow each other in regular sequence; we generally infer sexual intercourse from the parties living together; fecundation and conception as consequences are wholly matters of inference; so also birth as following therefrom is inferential. Now that these same processes are gone through with in the cases of all human beings is inferred from a universal experience, or one so general and uncontradicted as to warrant the inference that it is universal. Thus that all human beings have fathers is an inference. Moreover, that I am a human being is also an inference derived from a comparison of myself with others I see about me; that I existed yesterday or in any past time is also an inference from my memory. Accordingly we observe that the proposition *I had a father* is a conclusion from a number of implicit premisses, themselves matters of inference. The cognition, therefore, expresses a series

of inferences which are involved in its meaning and without which it would have no signification whatever. It is itself an inference from the premisses just set forth. Even so simple a recollection as *I went to London* is made up of inferences. That there is a place called *London* is an inference from common testimony; that I visited a certain town on a particular occasion I infer from a remembrance of a set of occurrences to me; that this town is the one called *London* I infer from testimony likewise.

Again take a cognition which is not expressly a judgment. It will be asked, what possible inference is there about the notion marked by the name *house?* This is the name of a single notion formed by the representation of a number of particular experiences generalised. It cannot be called an inference (some will say), and its presence in the mind is not evidence of a process of inference. Yet I think a little reflection will convince one that this cognition is not attainable without a series of inferences. In the cognition there is a conscious representation of experiences; the general notion is one representative of particular sensations had by me in time past; there are implied judgments at least that I had such sensations, and in this case of the existence of objects causing those sensations; but, as has been already remarked, these latter are inferential judgments. So that in the cognition of a *house,* were we to take away the judgments of past experience and existence, there would be no cognition present at all; and the presence of that cognition involves and requires these inferences. In representing *house,* I infer that I have seen houses and that they existed, and these inferences are a necessary part of the cognition. Here as elsewhere the act of representative cognising is an act of inferring. Equally is this true of other general notions. The word *white* stands for a cognition of some particular white thing which is a representation of or resembles something I have seen; also the co-ordinate cognition that there are numerous objects which agree with this in being white;—both of these cognitions are inferential.

Once more, the comparison of a present object with an absent one, so far as representation is involved, demands inference. All identifications require inference unless the objects identified are all present, and even then inference is not dispensed with, for we are obliged to infer that the objects remain the same from moment to moment. If I say *This is a horse,* there is a degree of inference not difficult to trace. I infer that the image I have in mind of the characteristics of horses had a reality corresponding to the object now before me, agrees with or is like a large number of other objects I have seen and other men have

seen; those other objects are not present, and unless I can infer the likeness and that such objects have existence or had it, I am not entitled to say *This is a horse.* Again, therefore, we see that so far as a cognition requires for its explanation the power of representation, it requires inference.

Further illustration may be found in going over carefully the objects of belief, as has been done elsewhere (MIND, No. VII.). We shall in every case see that wherever there is belief, there is inference. In the examples immediately antecedent we have examined some of these cases, and it is hardly necessary to review in detail all cases of belief. They substantially embrace beliefs in existences and events which have been experiences to me or some one else or which may become such experiences. That there have been any existences or events within my experience or within the experience of any one, is inferential (as has been explained); so also is the belief that anything may be expected to come within the experience of any person. But it will be remembered that the acts of representative cognition and belief we discovered to be the same; therefore, we again make an identification of inference and representative cognition.

If the analysis thus far made be correct, there are sundry corollaries which may follow whose importance is considerable, and which when expressed make still clearer the truth of what has been stated in regard to inference. Referring now to the fact previously brought out that representative cognition while distinguishable from presentative does not exist without the latter; that every cognition, every item of knowledge as a product, requires both presentation and representation; that consciousness itself would become unconscious were it not for both,—it will appear that inference is an ultimate and primordial act of mind and involved in all cognition. It is unanalysable, and itself a prime factor in consciousness.

Still further, it appears that the psychological processes of belief and inference are the same and that the attributes of the one may be ascribed to the other. For in a preceding essay (MIND, No. VII.) we learned the correspondence between belief and representative cognition, and observed that what could be attributed to the one of those two could be attributed to the other. We have thus made out three operations to be essentially the same, namely representative cognition, belief, and inference; the one is not present without the others; representative cognition would not be such without belief and inference, belief would not be belief in the absence of representative cognition and inference, inference is not inference at all without representative cognition and belief. But while, therefore, these three terms refer to the same mental operation, they are nevertheless

each applicable to somewhat different phases of it. Representative cognition is the generic term applicable to an act of representative apprehension, as such, irrespective of relations and expressions: *House, tree, I had a father, I lived in Boston, Trees have foliage, Men are mortal,* alike mark representative cognitions. When an agreement or disagreement between two distinct cognitions is apprehended, if the resultant cognition is prevailingly representative, it is, when expressed, a belief. The name Belief, when applied to an expressed product of cognition is attached to a proposition ; when applied to the cognitive operation itself, it is a judgment, not a single notion. *I lived last week; I shall be living in ten years; London is the largest city of England; Balthasar Gerard assassinated William the Silent; Men are mortal,* are propositions which are distinctively expressive of belief. When instead of one judgment made without dwelling upon its antecedents or consequents, there occur two or more following each other, the mind passing from one to the other with a dependence of the consequent upon the antecedent, we denominate the consequential judgment with reference to the other an Inference: *I lived last week (for I remember sensations occurring to me then); I shall be living in ten years (for men generally live to the age I shall have then reached); London is the largest city of England (as trustworthy authorities have stated); Balthasar Gerard assassinated William the Silent (for the concurrent word of many historians may be relied upon); Men are mortal (since universal experience has been that men have not lived beyond a certain maximum of years)*—all these are inferences from the judgments expressed by the propositions in parentheses, or others similar to them. Every proposition, consequently, which is characteristically representative may be regarded either as the expression of belief or of inference from implicit premisses. The word Inference, however, as characterising a proposition, is usually restricted to a conclusion from premisses found in the discourse in which the proposition occurs, and some of which at least are explicit and the others readily suggested by the context.

If there should arise in the mind of any one at this point a question why the mind cognises a dependence of one cognition upon another, the answer would be that this is explained by the laws of association. There are countless representative cognitions passing through the mind between which no relation of dependence exists; we do not say we infer one from the other. If I were to say, *Men are mortal, therefore dogs have tails* —we should hardly be justified in calling either cognition an inference from the other. I might nevertheless connect these two facts in thought so as to infer one from the other, and though

that would not make the inference a valid one, it would still be truly an inference. If I should for any reason come to establish a firm association between these two facts, so that when one was suggested the other should follow it, it would thus be entirely possible for me to infer one from the other. In this way all inferences are created and sustained. If there be a sufficiently strong association by contiguity and similarity, the established connexion will govern the transfer of the mind from one link to another. Representative cognition explains the act of inferring; the laws of association show how particular inferences come to be made and to exist in the manner in which they do.

The elaboration of inferences in the mind takes place most conspicuously and chiefly through the association of similars. Where the mind passes directly from one object to a second, identifying the one with the other, the process is commonly spoken of as Immediate Inference; where it arrives at its conclusion only through the intervention of a third or mediate object, the proceeding is denominated Mediate Inference. Although these distinctions have been very generally made in treatises on logic, I conceive them to be highly objectionable, for all inference, as we have seen, is mediate, that termed immediate being only relatively so—relatively simple and direct as compared with the other. If there be occasion, a distinction may be made and preserved in terms like Simple Inference and Complex Inference, indicating a difference in complexity, but no distinction should be allowed as to the nature of the process. The process of immediate inference is precisely the same as that of mediate inference, and both of them are mediate. In the first case, A suggests its similar B, two are compared directly and an agreement cognised between them. Now agreement means that in so far as two objects agree they are identical, and one may be substituted for the other. Power of substitution is the very essence of agreement, though logicians have not always noted the truth. To Professor Jevons the world is much indebted for the first explicit and complete enunciation of this doctrine (*Substitution of Similars* and *Principles of Science*). If then an agreement be cognised between A and B so that A = B, that B = A is not another cognition but a different expression of the same cognition. The mind through the presentative ideas *a* and *b* infers the equality of A and B the objects. Thenceforth A and B are associated and one may be substituted for the other, as regards quantity; the cognition instead of being $\boxed{A}$ and $\boxed{B}$ becomes $\boxed{A|B}$ and $\boxed{B|A}$. Thus far so-called Immediate Inference. If now $\boxed{B}$ has been

found equal to $\boxed{C}$, instead of our thinking simply B = C, the association of B at once arises in the mind and we think $\boxed{A|B} = \boxed{C|C}$ or unite the cognitions in groups like the following, $\boxed{B|C}$ $\boxed{A|B|C}$ $\boxed{A|C}$ $\boxed{C|A}$, &c.; that is A = B, B = C . ∴ A = C. We have, as it were, a double of B compared with C. What is affirmed in quantity of B may be affirmed of its other self its substitute A. The three objects $\boxed{A}$ $\boxed{B}$ and $\boxed{C}$ are brought together in the mind, and a link of connexion is forged between them all; what may be affirmed of A (we are now speaking of quantity) may be affirmed of B and C; what may be affirmed of B may be affirmed of A and C; and what may be affirmed of C may be affirmed of A and B. This is the first step in Mediate Inference. In the two cases, the one of immediate and the other of mediate inference, there is no difference in the kind of the process, but only a difference in the complexity and the length of the movement. When C is finally brought into the mind, its being equal to A is just as immediate an inference as that A = B; the mediateness consists in the fact that B was first necessary in order to suggest C—that the mind starting from A went to B and through B brought up C for identification with A. In an extended series of mediate cognitions, the process is one of repeated identifications, and a gathering together and carrying along all that have previously been gained to the next new case; this is more laborious, and when the end of the course has been reached the process appears longer, and, so far as we can determine, is longer than if the inference were an immediate one; but each new inference made in the process is just as much immediate and no more so than the inference A = B . ∴ B = A. Mediate inference, then, is only a series of immediate inferences, and immediate inferences are mediate or representative cognitions. I *believe* that A (object) = B and B = A, or though the ideas $a = b$, $b = a$, I *infer* that A = B; this is the simplest step in inference. By the same cognition I infer B = A; this is the second step. I then carry along A and B as equals to C, and identify C with A and B simultaneously, by the same cognition pronouncing that C = B and C = A; this is the third step. The first of these steps is representative cognition; the second is so-called immediate inference; the third is so-called mediate inference—all of them are but different degrees of representative cognition.

When by so-called mediate inference, which I should prefer to call *discursion*, A is found equal to C, the intervening link B may come to be discarded altogether. This operation is all the time going on in mental experience. Truths are reached by a

discursion through other truths and then the middle truth is dropped out of consideration (except perhaps in analysing the steps by which we arrive at the conclusion). Identifications are first made through suggesting media and afterwards are directly apprehended. For instance, experience has established the truth that rattlesnakes are poisonous. I see a certain snake different from any I have ever seen before, but which, from reading and information acquired *vivâ voce*, I esteem to be a rattlesnake. I then infer the reptile before me to be poisonous. There is thus established an association between a reptile of a certain appearance and the attribute poisonous; so that the next time I see a snake of that peculiar appearance I infer it to be poisonous without necessarily first considering that it is a rattlesnake. In truth, what is termed mediate inference occurs only where knowledge is partially integrated. When we are reasoning we are feeling our way to knowledge, or are confirming, establishing, and explicating knowledge; when we have settled the points about which we reason, and have laid out the results, we infer directly and necessarily according to our established associations, and what before has been the conclusion of a discursion in thought passes into the category of uncontradicted and even necessary truth.

Having now shown to the best of my ability the nature, sources, and more rudimental developments of inference, I have done all that is contemplated in this essay. The further exposition of the course and the products of inference embracing the subject of proof, the validity of inferences and the ramifications and classifications of inferential knowledge, so far as the same may be made the subject of distinctive and separate arrangement, belongs to treatises on logic and will not be pursued here. Our examination has gone far enough to illustrate the psychological character and place of Inference, its connexion with, and at the same time its opposition to, Intuition. To show that other minds have seen in somewhat the same channel as my own, regarding inference, I shall take the liberty of quoting (though without stopping to criticise), as bearing upon the subject and the views here maintained thereon, two or three sentences from a noteworthy article in the St. Louis *Journal of Speculative Philosophy*, by C. S. Peirce (Vol. II., pp. 140, 154) and a passage from the treatise on Logic in the *Encyclopædia Britannica*, both of which will be seen to harmonise substantially with this exposition, and may be esteemed corroborative in some degree of the correctness of the positions here taken. Says the former: "All mental action is reducible to the form of valid inference". "The association of ideas consists in this, that a judgment occasions another judgment of which it is the sign. Now this is

nothing less nor more than inference." "Inference is only a transition from one cognition to another." The writer in the *Encyclopædia* remarks:—"Logic evolves not laws which govern any one fact of mediate thinking taken singly, but relations between two or more such facts or laws which govern the derivation of one such fact from another or others. That which logic scrutinises is not one fact of thought, but a process constituted by a plurality of such facts. It considers thinking as knowledge or cognition, that is as having objects which are truths, but it assumes and systematises those laws only in virtue of which, one or more facts of knowledge being given, other facts of knowledge may be elicited from them. . . . Psychologically or subjectively considered, discursive thought exhibits no distinctive characteristics beyond those which belong to it as being necessarily mediate or representative. It is always resolvable into a series of judgments. Its peculiarity lies in the relation between the constitutive judgments; it is a relation in which the objective side is the more prominent of the two. We might say, indeed, that the relation subsists not between the acts of judging but between the judgments; not between one mental fact and another but between their several results or products."

Single terms, names, and words are not usually held as standing for inferences; that all the cognitions indicated by these symbols involve inferential cognition, however, may be repeated. The proper sphere of inference is judgment, and, as the writer in the last quotation seems to imply, not single judgment, but the relations between judgments. A proposition then is the characteristic expression of an inference. On the other hand single terms rather than propositions are the most appropriate expressions of intuitions. Probably the words indicating the purest intuitions are the exclamations as *ah! oh!* The personal pronouns as *I, thou, he,* and the demonstratives *this, that* frequently designate primarily an intuition; concrete names applied to an individual present, or a present experience, as *John, house, fire, cold,* are symbols of intuition. General names as such are marks of cognitions characteristically inferential; abstract names do not stand for intuitions at all. It is hardly proper to call any proposition intuitive. Even so simple and apparently immediate cognition as that expressed by *A is A* is as much inferential as intuitive—indeed, more so, for it depends for its validity upon the prior proposition *A is. A is A* is an inference meaning, *So long as A is, A is A.* The thought *I exist* is intuition mixed with inference; for existence is general in its meaning and hence representative. I only intuite that *I am I* by the prior cognition *I was I* at various preceding

moments; while, as a proposition, *I exist* stands for a presentative mixed with a representative cognition. Of course propositions imply intuition, but if we call them intuitions we are led into difficulty by the necessity of using the very same propositions as inferences. If we say *A is A*, standing for an intuitional cognition, is itself properly to be called an intuition, or that its prevailing character in general is intuition, we are met by such cases of its use as the one above taken, *A is A, for A is.* Evidently in this latter use *A is A* is an inference and inferential. Similarly every proposition may point primarily either to an intuitive or an inferential act of the mind, according to circumstances. Inasmuch, however, as propositions for the most part convey general knowledge and are highly representative, if they were as a class to be characterised by either of the two terms before us, the adjective *inferential* would be the more fitting. Most propositions can at once be shown to be inferences from implicit premisses. Language derives its value from the fact that it is general and common. Its office is to preserve and communicate, but this requires that it shall stand for representative cognitions. The meaning of a word is its general connotation, its representative character. A pure intuition cannot be expressed at all by language, any more than it can be found alone in mental experience.

We are now prepared for a brief summary to fix more clearly in mind the results attained in this essay.

First. Intuition is a cognitive act of immediate beholding, inference is a cognitive act of mediate beholding. Intuition corresponds with presentative and inference with representative cognition; the two are antithetical and mutually exclusive.

Second. Both intuition and inference are present in every act of cognition, varying as presentative and representative cognitions vary. No cognition is purely intuitive or inferential, but the prevailing character may be one or the other; a cognition may be relatively intuitive or relatively inferential. If either intuition or inference were wholly absent there would be no cognition at all but an absence of consciousness. Both are ultimate and unanalysable mental operations.

Third. Inferring and believing are the same cognitive act, both being phases of representative cognition. In believing, the mind dwells upon two cognitions seen to agree or differ, without considering attentively the relations of those two cognitions to anything save each other. In inferring, the mind connects two pairs of cognitions and cognises a relation of agreement in difference between them. Every representative cognition may be viewed as a belief or as an inference; every belief may be regarded as an inference and every inference as a belief.

Fourth. The formation and establishment of particular inferences as permanent products is the work of association, according to the laws of contiguity and similarity, the latter being the chief and most conspicuous process. The simplest and most direct inference lies in the cognition of identity or similarity between two objects, the essence of the agreement being the cognition of interchangeability between the two, so that one may be substituted for the other. As other associations are joined this process is repeated, and the mind advances discursively from one cognition to the other, carrying over to the conclusion what is in the premisses. As associations become more firmly established and many connexions are made, intermediate links are dropped and inference direct assumes the place of discursive inference: the latter is characteristic of the acquiring, confirming, and arranging of knowledge; the former occurs as a perfected result of the associating processes.

Fifth. Intuition is more characteristically expressed by single terms, inferences by propositions; no language, however, stands exclusively for either, but all language indicates both, since in every cognition the two are inextricably involved. In discourse, nevertheless, those propositions are commonly called inferences which are connected in dependence upon other propositions, the whole indicating a passage of the mind from one to the other in the relation of dependent and principal; with such the science of logic deals.

Dugald Stewart in a most remarkable and instructive passage (*Philosophy of the Human Mind*, Part II., ch. 2,) has, I think, approached more nearly than any other before his time (save perhaps Locke), and more nearly than the most who have since lived and written, to the true solution of the problems concerning the nature and connexion of the intuitive and ratiocinative powers of the mind. Stewart saw the intimate connexion of intuition and inference, though from their constant presence together he erroneously considered that there was no radical difference between them, and though he did not clearly and distinctly apprehend in their details the complete operation of the laws of association and of the representative powers in the production of all varieties of reasoning.

DANIEL GREENLEAF THOMPSON.

IV.—TRANSCENDENTALISM.

THAT the pure empiricism still in fashion among scientific philosophers leads naturally to scepticism is a fact which has been familiar to certain schools of thought ever since Hume presented it to the world stripped of its plausibilities. It is hardly to be believed that so subtle a thinker did not himself perceive the ultimate consequences of his reasoning. He must have been perfectly aware that on his system a philosophy of science was impossible; nevertheless, his "Essay on Miracles" and occasional announcements, such as that with which he ends his *Inquiry concerning Human Understanding*, appear to have quite convinced natural philosophers that his scepticism merely undermined religion, a result which to most of them was a cause of very moderate uneasiness. If, however, they ignored, and still ignore, the wider reach of that engine of destruction, it has not been for want of telling.

Hume himself makes no effort to conceal it, and the sneer with which he informs the students of science that theirs is the only kind of knowledge worth pursuing, is scarcely less obvious than that with which he tells the theologian that the most solid foundations of religion are "faith" and "divine revelation". But Hume's own view of his position is not the only, nor even the main, evidence for the sceptical nature of the conclusions to which his theories necessarily lead. On that scepticism, as we have been informed with sufficient iteration, is founded the whole imposing structure of modern German philosophy; and modern German philosophy, whatever be its value, is not a phenomenon which easily escapes notice. If it gives little light it is not because it is hidden under a bushel. In all probability, however, its very magnitude has prevented it from materially influencing the course of scientific philosophy in this country; and I believe I may almost say from permanently influencing scientific philosophy even in Germany. A man may be forgiven if, before seriously attempting to master so huge a mass of metaphysics, composed of several inconsistent systems, difficult of comprehension from their essential natures, still more difficult from the extraordinary jargon under which the ingenuity of man has concealed their import—he may be forgiven, I say, if he pauses and considers whether the time may not be better spent in reading something he is more likely to understand. It is, however, unfortunate that this pardonable, and even laudable, caution should have prevented so many people from trying to comprehend the exact difficulty which Kant and Kant's successors saw in the empiricism of Hume, and the extremely ingenious method which they

adopted in order to avoid it; for when these are understood it becomes at once plain that the difficulty is a real one, and that the solution offered of it, at any rate, deserves consideration.

The relation in which Kant stands to Hume is not a topic which it is necessary for me to discuss; nor, if it were, could I, it need hardly be said, add anything to what Mr. Green and Mr. Caird, not to mention previous commentators, have already written on the subject. My purpose is to examine the answer which, as I suppose, a transcendentalist would make to the sceptic on the two points of *causation* and the *existence of an independent world.*

Now the usual way in which the transcendental problem is put is, "How is knowledge possible?" and, taking transcendentalism as an answer to Hume, this, the usual way, is also the most natural, because it was Hume's theory of the *origin* of knowledge which led necessarily to scepticism. As, however, the sceptic need not put forward any view of the origin of knowledge, the question should rather be stated, How much of what *pretends* to be knowledge must we accept as such, and why? My business, therefore, is to extract from the answer which the transcendentalist gives to the first inquiry, an answer which shall, if possible, satisfy the second; and for this purpose it is necessary to make a slight, though only a slight, change in the usual mode of stating his doctrine.

In a former article in MIND (No. IX.) I insisted on the obvious truth that every tenable system of knowledge must consist partly of premisses which require no proof, and partly of inferences which are legitimately drawn from these. What, then, on the transcendental theory, are our premisses, and by what method do we derive from them the required conclusion?

If we were simply to glance at transcendental literature, and seize on the first apparent answers to the questions, we should be disposed to think that the philosophers of this school assume to start with the truth of a large part of what is commonly called science—the very thing which, according to my view of the subject, it is the business of philosophy to prove. "Respecting pure mathematical and pure natural science," says Kant (*Critique*, p. 13, Tr.), "as they certainly do exist, it may with propriety be asked *how* they are possible; for that they must be possible is shown by the fact of their really existing." "The question, How is knowledge possible? is not," says Mr. Green (*Contemp. Review*, Dec. 1877), "to be confused with the question upon which metaphysicians are sometimes supposed to waste their time, Is knowledge possible? . . . Metaphysic is no superfluous labour. It is no more superfluous, indeed, than is any theory of a process which without theory we already

perform." Passages of this sort would almost lead one to conclude that the business of transcendental speculation was not to justify beliefs, but to account for their existence: to tell us how we do a thing, not whether we ought to do it: a view by which, apparently, philosophy is regarded as dealing with the laws of thought much as physiology deals with the laws of digestion. If this were so, transcendentalism might be an important and useful department of science, but it could have nothing to do with the subject of this essay. It would answer no doubt, it would solve no difficulty. But, in truth, the language often used by Kant and echoed above by Mr. Green, if not incorrect, is certainly misleading. Transcendentalism *is* philosophical, in the sense in which I have ventured to use the term; it *does* attempt to establish a creed, and, therefore, of necessity it indicates the nature of our premisses and the manner in which the subordinate beliefs may be legitimately derived from them.

On the first point its statements are not, indeed, explicit and categorical; but this is simply because, for historical reasons, the philosophic problem has not been presented to it exactly in the shape which makes such statements necessary. Nevertheless, all I suppose that a transcendentalist would postulate in the first instance, or rather all that each man who studies his system is required to postulate, is that he knows, and is certain of, *something;* he is conscious, for example, or may be conscious, that he perceives a coloured object, or a particular taste; in other words, he gets some knowledge, small or great, by *experience.*

This very moderate concession, then, being granted, as it must be granted, by the sceptic, the next question that arises is, How can any knowledge worth speaking of be inferred from such premisses? It is in the answer to this that such force and originality as there may be in transcendentalism is really to be found; and it is here that the full meaning of the question which is placed at the head of that philosophy becomes manifest. "You allow," we may suppose a transcendentalist to say, "You allow that experience is possible; you allow that some knowledge, though it may only be of the facts of immediate perception, can be obtained by that channel. I therefore ask you how that experience is possible—in what it essentially consists: and whatever fact or principle I can show to be involved in that experience—whatever I can prove must be, if that experience is to be—of that you must, in common consistency, grant the reality." A principle so proved is said to be "transcendentally deduced," and it is the validity of that deduction in the cases of causation and the existence of an

independent world that we are now more particularly to examine.

The whole value, then, of the transcendental philosophy, so far as the questions raised in this essay are concerned, must depend on its being able to show that the trustworthiness of these far-reaching scientific postulates is involved in those simple experiences which everybody must allow to be valid. If it cannot prove this, it may still be a valuable contribution to a possible philosophy; it may still show by its searching analysis all that is implied in the existence of nature, as we ordinarily understand nature, and of the sciences of nature as we are taught to accept them: but more than this it cannot do; it cannot show either that such a nature exists, or that our accounts of it are accurate; it cannot, in other words, supply us with a philosophy adequate to our necessities.

Before going on to consider the general value of this method, or the success of its application in particular instances, it may be well to give some examples of its reasonings by which its precise character may be more clearly understood. Here, for instance, is one taken from Kant's proof of the principle of substance (*Critique*, pp. 140-141, Tr.):—

"Change cannot be perceived by us except in substances, and origin or extinction in an absolute sense, that does not concern merely a determination of the permanent, cannot be a possible perception, for it is the very notion of the permanent which renders possible the representation (perception) of a transition from one state into another, and from non-being into being, which consequently can be empirically cognised only as alternating determinations of that which is permanent. . . . Substances (in the world of phenomena) are the substratum of all determinations of time. . . . Accordingly, permanence is a necessary condition under which alone phenomena, as things or objects, are determinable in a possible experience."

Now the point of this demonstration lies, as the reader will see, in showing, or attempting to show, that experience of change is not possible unless we assume unchanging substance. Therefore, if we can experience changes (as we most certainly can), we are forced also to admit the existence of that without which change would have no meaning.

Here is another argument of the same kind respecting causation which I quote from Mr. Green's Introduction to Hume (pp. 273-4):—

"A uniformity which can be thus (*i.e.* by a single instance) established is, in the proper sense, necessary. Its existence is not contingent on its being felt by any one or every one. It does not come into being with the experiment that shows it. It is felt because it is real, not real because it is felt. It may be objected, indeed, that the principle of the 'uniformity of nature,' the principle that what is fact once is fact always, itself gradually results from the observation of facts which are feelings, and that thus the principle which enables us to dispense with the repetition of a sensible experience is itself due to such repetition. The answer is, that feelings which

are conceived as facts are already conceived as constituents of a nature. The same presence of the thinking subject to, and distinction of itself from, the feelings which renders them knowable *facts*, renders them members of a world which is one throughout its changes. In other words, the presence of facts from which the uniformity of nature as an abstract rule is to be inferred, is already the consciousness of that uniformity *in concreto*."

In this extract the argument is, that facts are unknowable, *i.e.*, are no facts for us, except as members of a uniform nature. We may be as certain, therefore, of the uniformity of nature as we are certain that we can know facts; which is another way of saying that we need have no doubt about the matter at all.

These quotations are not long enough, perhaps, to do full justice to the argument of which they contain one statement; but they are long enough to show of what sort the argument in either case is. And the essential force or point of those arguments, as against the sceptic, seems at first sight to lie in this: the sceptic, in questioning any principle, is shown to be making an illegitimate abstraction from the relations which constitute an object, an abstraction which is illegitimate, because it renders the object meaningless and unthinkable. He has to choose, therefore, between altogether giving up the reality of the object, or admitting a principle implied by one of the relations of which that reality can be shown to consist. He cannot, in all cases at least, do the first; he is bound, therefore, to do the second.

Now, before proceeding to examine the force of this reasoning, as it is employed in proving particular points, one difficulty must be discussed which attaches to it generally.

When a man is convinced by a transcendental argument, it must be, as I have explained, because he perceives that a certain relation or principle is necessary to constitute his admitted experience. This is to him a fact, the truth of which he is obliged to recognise. But another fact, which he may also find it hard to dispute, is that he himself and, as it would appear, the majority of mankind have habitually had this experience without ever consciously thinking it under this relation; and this second fact is one which it does not seem easy to interpret in a manner which shall harmonise with the general theory. The transcendentalist would, no doubt, say at once that the relation in question had always been thought implicitly, even if it had not always come into clear consciousness; and having enunciated this dictum he would trouble himself no further about a matter which belonged merely to the "history of the individual". But if an implicit thought means in this connexion what it means everywhere else, it is simply a thought which is logically bound up in some other thought, and which for that reason may always be called into existence by it. Now, from this very

definition, it is plain that so long as a thought is implicit it does not exist. It is a mere possibility, which may indeed at any moment become an actuality, and which, when once an actuality, may be indestructible; but which, so long as it is a possibility, can be said to have existence only by a figure of speech.

If, therefore, this meaning of the word *implicit* be accepted, we find ourselves in a difficulty. Either an object can exist and be a reality to an intelligence which does not think of it as under relations which, as I now see, are involved in it, *i.e.*, without which I cannot now think of it as an object; or else I am in error, when I suppose myself and other people to have ignored these relations in past times. If the first of these alternatives is true, the whole transcendental system, as I understand it, vanishes in smoke; if the second, it comes into apparent conflict, not only with science, and with the avowed scientific opinions of many of its disciples, but with the later form of the Transcendental Philosophy itself. For by that system the development of thought is in stages; it is driven on by its own proper nature from one stage to another till the highest of them is reached, where alone it can find rest and satisfaction. But those who believe most firmly in this theory by no means intend to assert as an historical fact that every thinking being is intellectually restless until he has grasped the Philosophy of the Absolute. What they must rather be held to mean is, that the inadequacy and self-contradiction of a universe thought under any of the lower categories can be demonstrated, and when demonstrated to me or any other thinking being, I or he may be obliged to seek repose by including the contradictory elements under some category which shall reconcile them in a higher unity; but they must admit that, as a matter of fact, this demonstration has been vouchsafed to few. There are not many, for example, who, whatever their perplexities, can find intellectual satisfaction in such a formula as this: "The universe is the process whereby spirit externalises itself, or manifests itself in an external world, that out of this externality, by a movement at once positive and negative, it may rise to the highest consciousness of self" (Caird's *Kant*, p. 427). The great body of mankind certainly prefer a contradiction which they do not see, to a reconciliation which they do not understand; and what I desire is not to be shown how, on transcendental grounds, such a position is untenable, but how its existence, as a fact, is to be consistently accounted for. The analogy of the ordinary logic is here misleading. It is true, no doubt, that we may intelligently hold premisses without perceiving all or any of the deductions which may be legitimately drawn from them, and that, in asserting the premisses in such a

case, we implicitly assert the conclusion; but this presents no difficulty, because it is not the recognition of the conclusion which makes sense of the premisses. In transcendental reasoning the case is exactly the other way. The ground, and the whole ground, on which we are forced by that reasoning to recognise the reality of certain relations, is, that without those relations the object of which we have experience would be as nothing for us; it would have neither meaning nor significance; and what I wish to know is, how it happens that the object appears to be "something" to so many people who are wholly innocent of any knowledge of those relations by which it is said to be constituted. If there is any value in this objection, it would apparently follow from it that movement or inference in this logic is an impossibility. So long as the transcendentalist refuses to move —so long as he merely declines to abstract the relations by which an object is already constituted,—he stands, perhaps, on firm ground; but directly he tries to oblige us to think a thing under new relations, his method becomes either ineffective or self-destructive. If, on the one hand, we *can* think the object *not* under these new relations, there is nothing in the method to compel us to do so; for the method consists in showing that without this new relation the object would not exist for us as thinking beings. If, on the other hand, we *cannot* think it except under these new relations, then, either we were not thinking it before or the relations are not new; and in either case there is no inferential movement of thought from the known to the unknown.

From these reflections it would appear that the transcendentalist must either give up the seeming fact on which his system depends, or explain away a seeming fact which is inconsistent with it. The first fact is, that a given relation is necessary to constitute a knowledge of an object; the second fact is, that a great many intelligent beings, and the transcendentalist himself during the earlier part of his life among the number, appear able to know it out of this relation.

Now, *one* solution of this difficulty has been already disposed of; it has been shown, or rather stated (for the assertion requires no proof), that a thought which is merely implicit is really no thought at all; it is a creation of language, which can constitute nothing, because it *is* nothing. It may, however, perhaps, be said that the thought is neither merely implicit nor wholly explicit, but exists in a kind of intermediate stage between nonentity and the fulness of clear consciousness; a stage in which it is strong enough, so to speak, to "constitute an object," but not strong enough to be known to the individual for whom it performs this important function.

This is apparently one of the views taken by the transcendentalist; for Kant says, with the approval of Mr. Caird, that "the consciousness (of a unity) may be but weak, so that we become aware of it only in the result produced, and not in the act of producing it; but that, nevertheless, the unity of consciousness must always be present, though it has not clearness sufficient to make it stand out" (Caird's *Kant*, p. 395). In other words, the unity of consciousness which is necessary for the existence of any experience may lie hidden, like a drop of some powerful chemical reagent, until its presence is made certain by the analysis of its results.

Such a theory as this requires us to hold that thought may, so to speak, diminish the amount of its being till it ceases to be known as thought, though not to behave as such; and no doubt the first half of this statement is correct. That a sensation can be weaker or stronger, can change its intensive quantity (to use the technical expression), is of course plain. It can also be thought of under more or fewer relations. And in both these ways it may be said to have varying degrees of being. The same may be said, *mutatis mutandis*, of thought. According as we fix our attention on the relation rather than on the things related, so we may, I suppose, say that our consciousness of the relation increases or diminishes; but the utmost diminution of which the consciousness is capable without annihilation makes no alteration in its quality; and if the consciousness vanishes, the thought must vanish too, since except on some crude materialistic hypothesis they are the same thing. This quantitative or intensive diminution of being, then, will not explain the apparent fact that so many people do not feel the necessity of thinking things under their necessary relations.

The second manner in which any object of thought can be imagined to vary its being depends on the number of relations by which it is qualified; and in this respect thought also, not less than sensation, may be said to increase or diminish. Relations may be compared and classed—that is, may be thought under relation not less than feelings; and as, no doubt, a relation which is not so compared and classed cannot be an object of thought, cannot be known as a relation, it may be supposed that here we have a definition of that intermediate stage which is required to smooth our own difficulties. Every man, it may be said, really thinks objects under the relations which seem to us, who have been enlightened by transcendentalism, to be necessary; but he is not *aware* that he does so, because he has not taken the trouble to consider them from the points of view from which alone they can appear as relations to *him*. But if this be true, what becomes of the identity of the *esse* and the *intelligi*?

If relations can exist otherwise than as they are thought, why should not sensations do the same? Why should not the "perpetual flux" of unrelated objects—the metaphysical spectre which the modern transcendentalist labours so hard to lay,—why, I say, should this not have a real existence? *We*, indeed, cannot in our reflective moments think of it except under relations which give it a kind of unity; yet once allow that an object may exist, but in such a manner as to make it nothing for us as thinking beings, and this incapacity may be simply due to the fact that thought is powerless to grasp the reality of things.

The transcendentalist, then, would seem peculiarly bound to admit what no philosopher, perhaps, would be disposed to deny, that thought which is not known as thought cannot properly be said to exist at all. He is therefore reduced to one of two alternatives. Either he must maintain that it is an error of memory and observation to suppose that every intelligence does not at all times think objects under their necessary relations, or else he must hold that a necessary relation is *not* a relation that is actually required to constitute an object for a thinking being, but is only one which, upon due reflection, a thinking being is unable to make abstraction of.

The first of these alternatives is somewhat too violent a contradiction of that experience which it is the business of transcendentalism to justify, to be seriously maintained by transcendentalists. Accordingly we find them admitting the fact that necessary relations are not always thought as qualifying the object they are supposed to constitute; in other words, accepting the second of the alternatives mentioned above, but at the same time declining any responsibility concerning a circumstance which, according to them, has to do only with the "history of the individual".

"The 'I think,'" says Kant (I am quoting Mr. Caird's translation,) "must be *capable* of accompanying all my ideas, for otherwise something would be presented to my mind which could not be thought; and that is the same thing as to say that the idea would be either impossible or, at least, it would be nothing for me." Again, "All ideas have a necessary reference to a possible empirical consciousness . . . but, again, all empirical consciousness has a necessary reference to a transcendental consciousness. . . . The mere idea 'I,' in reference to all other ideas (whose collective unity it makes possible), is the transcendental consciousness. This idea may be clear (empiric consciousness) or obscure. This we do not need to consider at present, nor even whether it actually exists at all; but the possibility of the logical form of knowledge rests necessarily on the reference of it to this apperception *as a faculty.*" "In other words," says Mr. Caird, commenting on this passage (*Philosophy of Kant*, p. 396), "Kant is here examining what elements are involved in knowledge, and therefore does not need to consider how far the clear consciousness of them is developed in an individual, *nor indeed whether the individual ever actually*

develops that consciousness at all. The individual (the sensitive being who becomes the subject of knowledge) may be at different stages on the way to clear self-consciousness. He may be sensitive with merely the dawning of consciousness: *he may be conscious of objects, but not distinctly self-conscious;* or he may be clearly conscious of the identity of self in relation to the objects. Thus we can imagine him to have many perceptions which he has not distinctly combined with the idea of self; or we may even suppose him (like children in the earliest period of their life) not to have risen to the idea of self at all, to the separation of the Ego from the act whereby the object is determined. But we cannot imagine him to have in his consciousness any ideas that are incapable of being combined with the idea of self: for such ideas would be ideas incapable of being thought, incapable of forming part of the intelligible contents of consciousness: they would be for us, as thinking beings, 'as good as nothing'. Though, therefore, we can think of an experience in which all the elements which the critical philosopher distinguishes are not consciously or separately present to the individual, we cannot think of an experience which does not imply them all."

From these extracts it would appear that both Kant and Kant's latest expositor are agreed in thinking that all that is required to constitute a perception—in other words, an experience—is *not* that the object of that perception should actually be thought in the relations which we are told are necessary to make it an object, but only that it should be *capable* of being so thought. But with such an admission the whole transcendental argument appears to me to vanish away. The rules which thought was supposed to impress upon nature, according to which nature must be, because without them she would be nothing to us as thinking beings,—these rules turn out, after all, to be only of subjective validity. They are the casual necessities of our reflective moments—necessities which would have been unmeaning to us in our childhood, of which the mass of mankind are never conscious, and from which we ourselves are absolved during a large portion of our lives. To argue from these necessities to the truth of things is merely to repeat the old fallacy about innate ideas in another form; for if thought does not make experience (and it appears that in any intelligible meaning of that expression it does not), then there is no reason for supposing that experience need conform to thought.

The net result of this discussion appears, then, to be that, according to transcendentalism, relations are involved in experience in at least two ways, the difference between which, though it is never recognised by that philosophy, is exceedingly important. According to the first way, an explicit consciousness of the relation in question is a necessary element in every possible experience; without it the experience would be "nothing to us as thinking beings," and by it, therefore, the experience may very fairly be said "to be constituted". But the number of relations, necessary in this sense, cannot be large, even according

to the transcendentalists themselves; nor can the necessity ever be established by argument, since the mere fact that somebody who knows the meaning of the words he uses disputes it, proves that it does not exist. If a man does not find that a particular relation, about which there is a question, is involved in his experience, an argument founded on the fact that no experience is possible which is not in fact constituted by an explicit consciousness of such a relation, is not likely to convince him that it is there. The mere consideration that proof is required makes proof impossible.

The second way in which a transcendentalist regards relations as involved in experience differs from that just discussed in several important particulars; for whereas in *that* the explicit consciousness of the relation was required to constitute the object, in this all that is required is that the object must be *capable* of being thought under the relation. It is plainly incorrect to describe the relation in this last case as "constituting the object"; it cannot even be said that the capability of being thought under the relation necessarily constitutes it; for according to the transcendentalist, *esse* is equivalent to *intelligi* —that is, an object *is* as it is apprehended by a thinking being, and since a thinking being can, as is admitted, apprehend it without in all cases perceiving the capability, this cannot be required to render the object real. By what proof, then, is this necessary capability established? How is it involved in experience? I can imagine no other general answer to these questions but this: The transcendentalist, in bringing an object into "clear consciousness," finds himself unable to make abstraction of a certain relation, and he thereupon proceeds to elevate this incapacity into a universal or objective rule, in defiance, as it seems to me, of the fact which he himself acknowledges, that other intelligences are in no way restrained by the same limitations.

Enough has perhaps been said about this general objection (if it be an objection) to the transcendental method, and it is now time to follow the philosophers who employ it in their special endeavours to show that when the nature of experience is once brought to the "clear consciousness" of the reader, he, at any rate, can be in no further doubt as to the necessity of regarding objects in space as independent, and all objects whatever as subject to the law of universal causation.

Kant's "Refutation of Idealism" was only introduced into the second edition of the *Critique*, and was the main occasion of Schopenhauer's assertion that Kant had changed his view, between the first edition of that work and the second, respecting the external world. I understand, however, that this is not

admitted by his later critics; that they regard the "Refutation" as satisfactory in itself, and as harmonising with the general course of its author's speculations; and that the proof of Realism contained in it is the one on which they would be disposed to rely. As such, therefore, I am forced to criticise it.

I say forced, because it is somewhat unwillingly that I go to Kant direct for the statement of an argument, partly because there is never any security that his disciples will admit that his reasoning in any particular case is in consonance with the rest of his system; partly because his obscurity is so great that his critics are as likely to be attacked for not understanding his arguments as for not having answered them, a proceeding by which what was intended to be a philosophical discussion is suddenly converted into an historical one. Yet the defects of his exposition are so great that no care will really avert this danger; for he has contrived to state a theory—of great difficulty in itself, and of which his own grasp does not appear to have been at all times perfectly sure—in language which always seems to be struggling to express a meaning which it can never get quite clear, and which possesses in an astonishing degree the peculiarity of being technical without being precise.

As, however, I am not acquainted with any neo-Kantian statement of the transcendental argument on this subject, it is to Kant himself that I must appeal, and fortunately the formal proof of Realism which he has advanced is so short (apart from the elucidatory notes) that I can quote it entire. It runs as follows:—

THEOREM.

"*The simple but empirically determined consciousness of my own existence proves the existence of external objects in space.*

PROOF.

"I am conscious of my own existence as determined in time. All determination in regard to time presupposes the existence of *something permanent* in perception. But this permanent something cannot be something in me, for the very reason that my existence in time is itself determined by this permanent something. It follows that the perception of this permanent existence is possible only through a *thing* without me, and not through the mere *representation* of a thing without me. Consequently, the determination of my existence in time is possible only through the existence of real things external to me. Now, consciousness in time is necessarily connected with the consciousness of the possibility of this determination in time. Hence it follows that consciousness in time is necessarily connected also with the existence of things without me, inasmuch as the existence of these things is the condition of determination in time. That is to say, the consciousness of my own existence is at the same time an immediate consciousness of the existence of other things without me." (*Critique*, Tr., p. 167.)

This proof, it will be observed, is transcendental, *i.e.*, its method of procedure is to show that an experience which we

certainly have—that, namely, of the series of our mental states as they occur in time—is impossible unless the thing to be proved, which is stated (though, as we shall see, incorrectly stated) to be the existence of external objects, be admitted. And the demonstration consists of two steps. First, it is asserted that the experience of a succession of things in time is impossible except in relation to something permanent, or, in other words, that the perception of change is inconceivable unless we at the same time perceive something which does *not* change. And in the second place, Kant goes on to say that, since that which changes in this case is myself (my phenomenal self), since the "things" which succeed each other in time are my own mental states, the unchanging object to which they are referred must be *outside* myself; that is, must be the external object whose existence was to be proved. So that if we immediately perceive the one, it can only be on condition that we immediately perceive the other also.

Such is the formal answer which Kant has given to Idealism; but it is not in this way only that he has treated the question, since in his proof of the principle of Substance (which precedes the "Refutation" in the *Critique*) he has brought forward arguments which, if sound, would seem to render any further refutation superfluous. For the "First Analogy of Experience" asserts this, "That in all changes of phenomena substance is permanent; and the quantum thereof in nature is neither increased nor diminished." (*Critique*, p. 136.) And as by *substance* Kant means something which, if it is not (as I think it is) exactly equivalent to what is commonly called *matter*, is at any rate the genus of which matter is one species; clearly this proposition is absolutely inconsistent with Idealism in the sense in which I use the term. If matter is permanent and indestructible, we need not further trouble ourselves as to whether there *are* or are *not* in nature other things besides our conscious states.

The proof of this principle of Substance, which I give partly in Kant's words, partly in Mr. Caird's, and partly in my own, runs somewhat in this way:

> All phenomena exist in time. Change is only conceivable in an unchanging time. But this time is not, and cannot be, itself an object of perception, but is rather a form given to the relations of perception, which presupposes that they are otherwise related. They must be otherwise related as determinations of a permanent substance. As all times are in one time, so all changes must be in one permanent object. The conception of the permanence of the object is implied in all determination of its changes. Change involves that one mode of existence follows another mode of existence in an object recognised as the same. Therefore a thing which changes, changes only in its states or accidents, not in its substance. An experience of absolute annihilation or creation is impossible, for it would

be an experience of two events so absolutely separated from each other that they could not even be referred to one time. The "First Analogy," therefore, is a deduction from the possibility of experience, and requires no empirical proof. When a philosopher was asked 'What is the weight of smoke?' he answered, 'Subtract from the weight of the burnt wood the weight of the remaining ashes, and you will have the smoke'. Thus, he presumed it to be incontrovertible that even in fire the matter (substance) does not perish, but only the form of it undergoes a change. *(Cf. Crit.*, p. 136; Caird, p. 453.)

The reader will at once perceive that while there is much that is common to the "Refutation" and the "First Analogy," there are some arguments and doctrines peculiar to each, a fact which makes the satisfactory discussion of the question rather difficult; because while it is impossible to treat the two arguments as identical, it is somewhat clumsy and would lead to a good deal of repetition to consider them altogether separately. The most convenient course, perhaps, will be first to consider the points which are to be found in both, and then to proceed with the examination of their mutual relationship and with what is special to each.

The first difficulty which occurs to me, and which perhaps others may feel, refers to that "transcendental necessity" which is the very pith and marrow of the whole demonstration, both in the "Refutation" and in the "First Analogy". Is it really true that change is "nothing to us as thinking beings" except we conceive it in relation to a permanent and unchanging substance? For my part, however much I try to bring the matter into "clear consciousness," I feel myself bound by no such necessity. For though change is, doubtless, unthinkable, except for what Mr. Green calls a "combining" and, therefore, to a certain extent, a "persisting consciousness," and though it may have no meaning out of relation to that which is "not-change," this "not-change" by no means implies permanent substance. On the contrary, the smallest recognisable persistence *through* time would seem enough to make change *in* time intelligible by contrast; and I cannot help thinking that the opposite opinion derives its chief plausibility from the fact that in ordinary language permanence is the antithesis to change; whence it is rashly assumed that they are correlatives which imply each other in the system of nature. It has to be noted also, that Kant, in his proof of the "First Analogy," makes a remark (quoted and approved by Mr. Caird) which almost seems to concede this very point, for he says *(Crit.*, p. 140): "Only the *permanent* is subject to change: the mutable suffers no change, but rather *alternation;* that is, when certain determinations cease, others begin". Now there can be no objection, of course, from a philosophical point of view, to an author defining a

word in any sense he pleases: what is not permissible is to make such a definition the basis of an argument as to matters of fact; yet the above passage suggests the idea that Kant's proof of the permanence of substance is not altogether free from this vice. If (by definition) change can only occur in the permanent, the fact that there *is* change is no doubt a conclusive proof that there is a "permanent". But the question then arises, *Is* there change in this sense? How do we know that there is anything more than alternation which (by definition) *can* take place in the mutable? All transcendentalists convince by threats. "Allow my conclusion," they say, "or I will prove to you that you must surrender one of your own cherished beliefs." But in this case the threat is hardly calculated to frighten the most timid philosopher. There must be a permanent, say the transcendentalists, or there can be no change; but this surely is no very serious calamity if we are allowed to keep alternation, which seems to me, I confess, a very good substitute, and one with which the ordinary man may very well content himself.

To those who agree with the preceding account of our intellectual necessities, who can either conceive change without permanence, or are content to get along with the help of "alternation," it will seem absolutely fatal to the whole Kantian argument, both in the "First Analogy" and the "Refutation". To those who do not agree, it will only be a difficulty in so far as the existence of any mind unconscious of transcendental necessities is inconsistent with the transcendental theory—a point I have already discussed. But let us pass over this, and grant, for the sake of argument, that change in general, or the succession of our mental states in particular, can only be perceived in relation to a permanent something; then I ask (and this is the next most obvious objection) why, in order to obtain the permanent something, should we go to external matter? As the reader is aware, the "pure Ego of apperception" supplies, on the Kantian system, the unity in reference to which alone the unorganised multiplicity of perception becomes a possible experience; and it seems hard to understand why that which supplies unity to multiplicity, may not also supply permanence to succession. Kant has, indeed, anticipated this objection and replied to it; but as I understand the objection much better than I do the reply, I will content myself with giving the latter, without comment, in Kant's own words:

"We find," he says, "that we possess nothing permanent that can correspond and be submitted to the conception of a substance as intuition, except *matter*. . . . In the representation *I*, the consciousness of myself is not an intuition, but a merely intellectual representation produced by the spontaneous activity of a thinking subject. It follows that this *I*

has not any predicate of intuition, which, in its character of permanence, could serve as correlate to the determination of time in the internal sense—in the same way as impenetrability is the correlate of matter as an empirical intuition." *(Critique*, p. 168.)

Though I do not profess altogether to understand the reasoning, it is, at all events, clear from it, that "the permanent" whose existence in demonstrated, must be an object of perception, a fact which is also evident from various passages in the proof of the "First Analogy," as, for instance, this: "Time itself cannot be an object of perception. It follows that in objects of perception, that is, in phenomena, there must be found a substratum," &c. *(Critique*, p. 137.) It is difficult to see indeed how that which is a quantity, incapable of either increase or diminution, can be other than an object of perception—it cannot at all events be a concept—and we may, I think, assume from the whole tenor of Kant's argument, as well as from his categorical assertions, that the substance of which he speaks is a phenomenal *thing*. But if it be perceived, and if it be a phenomenon, where is it to be found? In the perpetual flux of nature, where objects do indeed persist for a time, but where (to all appearance) nothing is eternal, who has had experience of this unchanging existence? By a dialectical process, probably familiar to the reader, we may with much plausibility reduce what we perceive in an object to a collection of related attributes, not one of which is the object itself, but all of which are the changing attributes or accidents of the object. But if this process be legitimate, the "substratum" of these accidents is either never perceived at all, or at all events is only known as a relation. In neither case can it be the permanent of which Kant speaks, since in the first case it is not an object of immediate perception; in the second it can hardly be regarded as an object at all.

"But (it may perhaps be replied), by a remarkable coincidence, science has established by a wide induction the very truth which Kant attempts to prove *à priori*. When men of science tell us that matter is indestructible, it is to be presumed that they attach some meaning to the phrase, and are referring neither to a metaphysical substance nor to an evanescent appearance. When Kant uses the same phrase, it may be supposed that he refers to the same object." For my own part, I confess to a rooted distrust of those remarkable coincidences between the results of scientific experiment and *à priori* speculation; nor does a closer examination of this particular case tend to allay the feeling. It is true, no doubt, that science asserts matter to be indestructible; but what is the exact meaning of the phrase, and what is its evidence? Can we perceive any thread of

identity running through all the various changes which (what we describe as) one substance may undergo? To a certain extent science assures us that we can. There are two, though, so far as I know, only two attributes of matter, namely, its relation to a moving force and its power of attracting and being attracted by other matter, which never alter; or—to put it more strictly—if we take a certain "area of observation" (say a closed vessel) out of which matter cannot pass and into which it cannot enter, then, whatever changes occur within this, the matter there, whether always the same or not, never varies in respect of these two properties. But it has to be observed, that though we can directly perceive both velocity and weight, the fact that there are unchanging relations between a given portion of matter and a given force, or between two portions of given matter, can only be established by an elaborate process of inference involving a large number of assumptions. It might therefore be plausibly contended that, though *they* are perceived, their *permanence* is not, so that they cannot properly be said to form any permanent element in perception. Passing over this possible objection, however, and granting, for the sake of argument, that we directly perceive the permanence of these two properties of matter, it is still clear that, since these are the only two properties of which we can say as much, either they must constitute matter, or matter, in so far as it is permanent, cannot be an object of perception. The first alternative is inadmissible, because these properties are merely relations between certain portions of matter and something else. The second would seem to be inconsistent with the Kantian proof.

The reader will understand that I am not here contending that Kant's conclusion is inconsistent with science, or that the scientific inference is wrong, either in its method or its results. My point is rather this:—Though Kant does not, of course, conclude to the necessary permanence of matter merely from its permanence in perception, nevertheless its permanence in perception would seem to be involved in his proof. Now I assert that what we perceive, *in so far as it is perceived*, is either not matter or is not permanent; and I maintain that an examination of that part of the ordinary scientific or empirical proof which bears on the question really confirms this view.

It may perhaps be thought (and some of Kant's expressions countenance the view) that he means to say no more than that we perceive the permanent substance by means of certain of its accidents. But this seems to raise new difficulties. First, how is the phenomenal substance, thus mediately known, to be distinguished from the *noümenal* substance, which, if it be known at all, is known precisely in the same way? Why

should we suppose it to be in time or space? Why should we suppose it to be a quantity? And how, finally, can we say, with any meaning, that such a substance is phenomenal at all? To put the matter in one sentence: When Kant says that "all determination in regard to time presupposes the existence of something permanent in perception," if his assertion is to be taken literally, it is in contradiction with experience, for there is nothing permanent in perception, unless we choose to describe the relations of matter to force and other gravitating matter in that way; if, on the other hand, he means that what we perceive *indicates* the existence of something permanent, he has first got to prove the fact, and has then got to show that the permanent whose reality is thus established is identical with the external world of science and common sense; and lastly, to point out how we can be said to be "immediately conscious" (*Critique*, p. 167) of that which we only know through, and by means of, its attributes.

Such, then, are the chief objections which, as I think, apply with equal force to the "First Analogy" and the "Refutation". Before going on to explain two further difficulties, which are particular in their nature, let me point out a curious consequence which may be extracted from the two demonstrations considered together.

Kant's argument in the "Refutation" consisted, it will be recollected, in showing that we could have no experience of our own changing mental states unless we perceived some permanent object outside us; while in the "Analogy" his argument involved the assertion that all changes are but the determinations of some permanent substance, which itself never changes. According to the "Analogy," therefore, our changing mental states, like all other changes, must be determinations, or, as they are usually called, accidents, of a permanent substance; while, according to the "Refutation," this permanent substance must be an object of perception independent of us and outside us in space,—in other words, matter. Between them these two propositions would seem to furnish a complete transcendental proof that our conscious states are mere accidents of matter; so that the crude materialism of certain physiologists, far from being the rash, not to say meaningless, conclusion of an unphilosophic empiricism, is demonstrable *à priori* by the most approved critical methods!

The only further remark I have to make on the "First Analogy" is of the nature, perhaps, of a verbal criticism. Kant speaks throughout of matter as if it were a definite quantity in nature, a quantity which could neither be increased nor diminished. But this would seem to be inconsistent with his

theory that a vacuum is impossible, because if matter is wherever space is, it must, one should think, be not less impossible to conceive the first as a totality than it is to conceive the second; and the words "increase" and "diminution" must be altogether meaningless in their application to a quantity whose amount is necessarily indefinite. Kant's expression, therefore, is a somewhat loose one, and he must be held to mean simply that matter exists, and that no portion of it can be created or destroyed. I may add that in his discussion of a vacuum he points out that matter may be a quantity in more than one way, but that neither in the "First Analogy" nor the "Refutation" does he explicitly tell us in which way it is incapable of diminution. It would be interesting to know this, in order that his results might be compared with the results at which, by very different methods, men of science have arrived.

My concluding criticism refers to the "Refutation," and I must ask the reader to turn back to it, and to compare the thing which Kant announces his intention of proving, with the thing he professes to have proved. In the "Theorem," the thing to be demonstrated is the existence of external objects in space; in the "Proof," the thing actually demonstrated is the existence of things without me,—"without me" being evidently equivalent to "other than my conscious states, as determined in time". Now if these two expressions really meant the same thing, any further refutation of idealism would be perfectly superfluous. No human being that understood the meaning of his own words would for a moment deny that there were objects in space, and therefore without him in the sense of being outside his body. The real question is this—Does being in space and outside the body imply that the extended and external object is outside the mind, and other than one of a series of conscious states? The realist asserts that it does; the idealist asserts that it does not; and to assume, as Kant appears to do, that the one proposition is very much the same as the other is, in reality, to beg the whole question at issue. For unless Kant's intention is merely to demonstrate the existence of extended objects, which it is equally unnecessary and impossible to do, it must, I suppose, be to show that their existence is independent of their being perceived,—neither beginning with it nor perishing with it; and in order to do this he must prove, from his point of view, two things. The first of these is, that the consciousness of one's own existence in time is only possible on the supposition that something permanent exists outside, *i.e.*, other than, one's self; the second is, that this permanent and independent thing is extended matter. The evidence for the first of these positions I have already considered; the evidence for the second is no-

where explicitly stated; but I cannot help suspecting (though it seems scarcely credible) that Kant absolved himself from providing any, by quietly taking for granted that "outside" in one sense is equivalent to, or, at all events, necessarily implies, "outside" in the other. With the difficulty which most philosophers feel in understanding how that which is an immediate object of perception can be other than *in consciousness*, a difficulty which is certainly not lessened by the Kantian theory of space, Kant himself makes no attempt to deal.

I turn now from the transcendental proof of an External World to the transcendental proof of the Law of Causation.

In his proof of the law of Causation, contained in the "Second Analogy of Experience," Kant, if I understand him rightly, adopts two lines of argument, the one on which he appears to lay most stress being consistent neither with itself nor with the other. In discussing it I am unfortunately deprived of the assistance of Mr. Caird, who, in the exercise of his discretion as an expositor of the Critical Philosophy, has chosen practically to ignore it. I will not venture to determine whether in so doing he has or has not somewhat transgressed even the very wide limits allowed him by the plan of his work; but lest the reader should imagine that the absence of the argument I am about to state from the commentary, implies its non-existence in the original, I will ask him to consult the *Critique* (p. 142), and see whether it may not be attributed to Kant with as much plausibility as any in the whole range of the work. It runs as follows—I give it partly in my own words, partly in Kant's, though the italics are always mine:—

"Our apprehension of the manifold of phenomena is always successive." But sometimes we regard this manifold of phenomena as constituting an object (say a house), sometimes as a series of events (as when a ship is seen to float down a river). Subjectively, in apprehension, these two series would seem to be of the same kind; objectively, as every one knows, we widely distinguish them. We no more suppose that the upper story of the house, if we begin looking at it at the top, is a phenomenon preceding in time the ground floor, than we suppose the ship is at the same time at two different places on the river. Yet in consciousness we perceive the ground floor *after* the upper story, exactly as we perceive the ship lower down the river *after* we perceive it higher up. The problem then that requires solution is this: How do we distinguish, as in experience we certainly *do* distinguish, the first series from the second? And Kant's answer is that we can only distinguish them if we regard the order of the first series as arbitrary, and that of the second as subject to a rule. "In the former example my perceptions in the apprehension of the house might begin at the roof and end at the foundation, or *vice versâ;* or I might apprehend the manifold in this empirical intuition by going from right to left or from left to right. Accordingly, in the series of these perceptions, *there was no determined order* which necessitated my beginning at a certain point in order empirically to connect the manifold." In the second case the order is objective: it in no way depends on the mode in which we

choose to represent it; and this can only be if we suppose that it occurs in conformity with a rule or law. And this becomes at once apparent, if for an instant we try and imagine the contrary to be the case. "Let us suppose that nothing precedes an event upon which this event must follow in conformity with a rule. All sequence of perception would then exist only in apprehension, *that is to say, would be merely subjective*, and it could not thereby be objectively determined what thing ought to precede and what ought to follow in perception. In such a case we should have *nothing but a play of representation*, which would possess no application to any object. That is to say, it would not be possible through perception to distinguish one phenomenon from another, as regards relation of time; because the succession in the act of apprehension would always be of the same sort, and therefore there would be nothing in the phenomenon to determine the succession, and to render a certain sequence objectively necessary. And, in this case, I cannot say that two states in a phenomenon follow one upon the other, *but only that one apprehension follows upon another.* But this is merely subjective, and does not determine an object, and consequently cannot be held to be cognition of an object—not even in the phenomenal world. Accordingly, when we know in experience that something happens, we always suppose that something precedes, whereupon it follows in conformity with a rule. For otherwise I could not say of the object that it follows; because the *mere succession in my apprehension, if it be not determined by a rule in relation to something preceding*, does not authorise succession in the object. Only therefore in reference to a rule, according to which phenomena are determined in their sequence, that is, as they happen, by the preceding state, can I make my subjective synthesis (of apprehension) objective; and it is only under this presupposition that even the experience of an event is possible."

Starting then from the succession in apprehension, or the subjective succession of phenomena, Kant had to distinguish from it—*first*, the objective *coexistence* which constitutes a thing in space, a house, a tree, and so forth; and *second*, the objective succession which constitutes a series of events. As I pointed out in the argument on the independent world, he does not, so far as I know, furnish any principle of objective coexistence, but in the law of causation he finds the principle of objective sequence. Or, to put it in a transcendental form, he holds that the experience of (objective) events is only possible if we presuppose the law of causation, and as we certainly have such an experience, &c.

Now, regarded as a proof of the law of universal causation, the argument I have just stated is scarcely worth criticising. In the first place Mr. Caird, after Schopenhauer, admits that the conclusion is inconsistent with one of the premisses. If it can be said to prove that sequence in the object is "according to a rule," it is only by showing in the first instance that sequence in the subject is arbitrary; so that the causation proved is at all events not universal. But in the second place, it does not prove, or attempt to prove, that there is actually an objective sequence according to a necessary rule, but only that *if* there is an objective sequence it must be according to a necessary rule,

because otherwise it could not be distinguished from the subjective sequence. Now these are very different propositions; and the second or conditional one might be admitted to its full extent, without admitting the truth of the first or unconditional one, which is for purposes of science the proposition of which proof is required.

The second proof which Kant gives of the principle of causality is so hidden away in the recesses of the first, that some doubt might perhaps be thrown on whether he intended formally to put it forward as a proof at all. The fact that it is in direct contradiction to the first proof, does not perhaps go far towards helping us to a decision on this point; but in any case the matter is not of much importance, as I am more concerned with the meaning which the post-Kantians extract from his writings, than with that which he himself intended to put into them.

The first proof attempted to show that the experience of an objective sequence was only possible if it was distinguished from a subjective sequence by being according to a rule. The second proof attempts to show that *no* sequence can be experienced except on the same terms. It is plain, therefore, that the second proof aims at demonstrating a causation which is universal, and which cannot, therefore be reconciled with the partial causation contemplated by the first. It only remains for us to examine whether it is more satisfactory. I give it entire in Mr. Caird's words. (*Phil. of Kant*, pp. 454-5.)

"The judgment of sequence cannot be made without the presupposition of the judgment of causality. For time is a mere form of the relation of things, and cannot be perceived by itself. Only when we have connected events with each other can we think of them as in time. And this connexion must be such, that the different elements of the manifold of the events are determined in relation to each other in the same way as the different moments in time are determined in relation to each other. But it is obvious that the moments of time are so determined in relation to each other that we can only put them into one order, *i.e.*, that we can proceed from the previous to the subsequent moment, but not *vice versâ*. Now, if objects or events cannot be dated in relation to time, but only in relation to each other, it follows that they cannot be represented as in time at all, unless they have an irreversible order; or, in other words, unless they are so related according to a universal rule, that when one thing is posited something else must necessarily be posited in consequence. In every representation of events as in time, this presupposition is implied; and the denial of causality necessarily involves the denial of all succession in time."

It appears to be asserted in this proof that we cannot conceive succession, unless we suppose that there is a necessary order in phenomena to enable them, so to speak, to correspond with and fit into the necessary order in the moments of time. "Events are determined in relation to each other in the same

[*i.e.*, I suppose, *some corresponding*] way, as the different moments in time are determined in relation to each other." But in so far as I can attach any definite meaning to these words at all, they seem to distinguish two things which are really the same, and to confound two things which are really distinct. The "order" of events and the "order" of moments are not two kinds of order but one kind, and if we assert that two events succeed each other, we are describing precisely the same relationship between them as when we assert that two moments succeed each other. When, on the other hand, we assert that one event is the cause of another, we assert not only this actual succession, but also, by implication, a similar succession whenever an event resembling the cause or first term in the relationship may happen to occur. But this relationship is so far independent of time, that though it *must* occur in *some* time it *may* occur in *any* time, and it in no way corresponds with the relation between actual successive events or successive moments which can never be repeated, because the related terms can never recur. Event A and moment *a* are followed by event B and moment *b*. This happens once actually and, if you please, necessarily; but it never happens again. The events vanish into the past as certainly as the moments in which they occur, and they can as little be recalled. But all this has nothing to do with causation. What the principle of causation, strictly speaking, asserts is, not that if event A recurs it will be followed by event B, for event A cannot possibly recur; but that if an event similar to A recurs, an event similar to B will certainly follow: and how this second hypothetical assertion is involved in the categorical assertion of a simple historical succession between actual concrete events and moments, altogether passes my understanding.

The transcendental view appears to be that, because there is a necessary order between successive moments, therefore there must be a necessary order between successive events; and this desired necessity can only be found in the principle of causation. But if there was no causality at all, the order of events would still be just as much or just as little necessary as the order of moments. An event is what it is because it happens when it does. A moment is what it is because it occurs when it does. Neither the one nor the other could occur at any other time, simply because by so doing it would cease to be itself. It is true of course (and this is no doubt the cause of all the confusion) that we habitually talk of the *same* event as occurring at *different* times, while we make no such assertion respecting particular moments. But this is simply because the whole essence of a moment consists in the time at which it occurs, whereas it is commonly the case that this is the least interesting of all the

relations which constitute an event, and the one of which it is therefore most often convenient to make abstraction. Nor is it to the purpose to say that events cannot be dated in relation to time, but only in relation to other events; because in every sense in which this can be asserted of particular events, it can likewise be asserted of particular moments. If, therefore, this fact necessitates causation in the one case (which, however, I deny), it must necessitate it also in the other—which is absurd.

Other objections besides these might no doubt be taken against particular points in the transcendental proof, but the best refutation of it is to be found in its own version of its general nature and object. That object is simply to show that a clear idea of succession is impossible except to those who first regard phenomena as necessarily connected according to the principle of causation; which again is as much as to say that by far the larger part of mankind have no clear idea of succession at all. And when I say the larger part of mankind, it must be remembered that in that majority are included not only all those who do not believe in the universality of causation, but also almost all those who do; since I will make bold to say that the greater number of these, however much they turn their minds to the nature of succession in time, do not find involved therein the principle of cause and effect. This necessity, then, under which the transcendentalists labour, if it is to be of "objective" application, and is to have any philosophic value at all, requires us to believe that mankind has been, and is, suffering under a very singular illusion respecting the clearness of its own ideas, on a point which is commonly thought to be so simple as to defy further analysis. This by it itself is sufficiently hard to believe; and the difficulty does not diminish when we come to examine the matter more closely. For what does the supposed necessity oblige us to hold? That when we perceive two events in succession, the first is the cause of the second? Not at all. But that when we perceive two events in succession, there exists *somewhere* a cause for the second—a cause possibly (indeed, probably) of which we are, and shall remain for ever, ignorant! So that what the transcendental doctrine comes to is this, that we can have, and do have, an idea of succession which is not causal, but that we cannot have such idea, at least in "clear consciousness," which does not involve the idea of some *other* succession which is indeed causal, but one element of which is, or may be, quite unknown to us!

On the whole, then, I cannot agree with Herr Kuno Fischer that Kant's "giant strength" (Fischer's *Kant*, Tr. p. 118) has been very happily employed in this attempt to place the

doctrine of causation beyond the reach of sceptical attack; on the contrary, it seems to me that all the difficulties inherent in the transcendental method, and all the confusion and obscurity which are so often to be met with in Kant's use of that method, are strikingly exhibited in his treatment of this central and important principle. It is commonly asserted that it was Hume's theory (that our expectation or belief in the uniformity of Nature is the result of habit) which suggested to Kant the necessity of finding some more solid basis on which to rest our systematic knowledge of phenomena. If so, it is unfortunate that it should be precisely at this point that the ingenious and important method of proof which it is his chief glory to have invented, most obviously and completely breaks down.

I have only to point out, in conclusion, that had the transcendental demonstration been as sound in all its parts as Herr Kuno Fischer and Mr. Caird suppose it to be, the thing proved is not sufficient by itself to serve as a basis for scientific induction.

All that Kant can be said, on the most favourable view of his reasoning, to have established is that, to use his own words, "the phenomena in the past determine all the phenomena in succeeding time"; or, as Mr. Caird phrases it, "the subseqent state of the world is the effect of the previous state". But something more than a fixed relation between the totality of phenomena at one instant and the totality of phenomena at the next instant, is required before we can, in the scientific sense of the expression, assert that these are "laws of nature". A law of nature refers to a fixed relation, not between the totality of phenomena, but between extremely small portions of that totality; and it asserts a fixed connexion, not between individual concrete phenomena, but between classes of phenomena. Now by no known process of logic can we extract from the general proposition, that "the subsequent state of the world is the effect of the previous state," any evidence that such laws as these exist at all; and what is more, this general proposition might be perfectly true, and yet the course of nature might be, to all intents and purposes, absolutely irregular, even to an intelligence which, very unlike our own, was able to grasp phenomena in their totality at any given moment. For "regularity" is an expression absolutely inapplicable to series in which there is no kind of repetition; and we have no reason for supposing—from the point of view of science we have every reason for *not* supposing—that the world will ever return exactly to the same state in which it was at some previous moment.

If therefore we have grounds for believing that the states of the universe at two successive instants are connected only as

wholes, and not necessarily by means of independent casual links between their separate parts, then of such a universe we could say, perhaps, that its course through time was *determined*, but we could not say that it was *regular*, nor would it be possible for a mind, however gifted, to infer, by any known process of reasoning, its future from its past.

ARTHUR JAMES BALFOUR.

V.—PHILOSOPHY IN ITALY.

DURING the seventeenth and eighteenth centuries, while the field was occupied in France and England by the schools of Descartes and Locke, followed by the scepticism of Hume and by the *Encyclopédie*, and while Leibnitz and Wolff flourished in Germany, Italy had no speculative movement of its own. penetrating to the depths of the national thought, and constituting a true tradition of philosophical study. On the decline of the splendid era of the Renaissance, when the arms of the foreigner were pressing heavily on the Peninsula, civil and political liberty died out, and with it all intellectual life, save only what still managed to survive in the departments of history and natural science. We were then as if cut off from the current of Modern Philosophy. The germs deposited by our thinkers of the second half of the fifteenth century ripened and bore fruit elsewhere. With us there remained only the galvanised Scholasticism of the Jesuits. Giovan Battista Vico, a solitary genius and pioneer of modern thought, died poor and uncomprehended. When the revolutionary storm of 1789 burst upon us, we were so flooded by French ideas, that at the beginning of this century those Italians who did not profess the theology of the Church of Rome were, with few and rare exceptions, followers of the *Encyclopédie*, Condillac and Cabanis. Genovesi at Naples, and Gioja and Romagnosi in the north of Italy (though the last-named refuted the theory of Transformed Sensation), applied the principles of Sensationalism to psychology, and to political economy with the other social sciences. Judicious writers, of no great speculative originality but of extensive and solid learning, and aiming at essentially practical ends, they betrayed in every portion of their works, even to their frenchified style, the influence of foreign contemporary authors. A doctrine which, though not unaffected by Kant's philosophy, might yet be said to be in part original and Italian, first appeared in the writings of the Calabrian, Pasquale Galluppi. Then, in 1830, the Abate Antonio Rosmini of Rovereto (long before

his death) published at Rome his *Nuovo Saggio sull' origine delle idee*, and this, followed by the works of Vincenzo Gioberti, started the only philosophical movement that has exercised any wide influence on our national thought and life.

I. This movement, which occupied the whole of the second quarter of the present century, succeeded in giving a kind of unity to speculative studies in Italy by trying to reconcile the traditions of the past with the new needs of the present, Catholicism with Philosophy, and native with foreign thought. To give effect to this attempted reconciliation, and to render it an active element in the national restoration, it was enough that it should be thought possible; which it was—under the influence of that sentiment and those political ideas which are the historical factor that must be kept constantly in view for the right understanding of the various manifestations of intellectual life in Italy. But of our three principal philosophers, Rosmini and Gioberti alone exercised a wide civil and political influence. The doctrines of Galluppi had a character and purpose essentially speculative. Born in 1770, and reaching the age of 40 before the publication of his *Saggio filosofico sulla Critica della conoscenza*, Galluppi did not come to be known throughout Italy till 1827, while his influence, especially in the north, was soon superseded by that of Rosmini and Gioberti. Rosmini, with a mind of greater power and breadth, conceived in his youth the system which occupied his mind all through life, and as a man, as a philosopher, as the founder of a monastic order, and as the intimate friend of the most illustrious men in Italy, he wrought far more deeply on his fellow-countrymen. The course of events and the tendencies of European culture from 1815 to 1830 favoured the direction which he gave to Italian thought, and its counterpart is to be found in the line taken about the same time in literature by Manzoni (afterwards a friend and disciple), following in the wake of the German Romanticists. It was a reversion to the Christian Idealism of the Middle Ages, of which the tradition still lingered in a portion of the Italian clergy, and at the same time it was an attempt to bring into greater prominence the Platonic element in this doctrine, harmonising it as far as possible with the spirit of modern philosophy and polity.

This purpose is especially discernible in Gioberti, joined with a much more pronounced tendency to identify religion and philosophy and make them the spring of a new national life. In his works written during exile in France and Belgium (1833-48), he plants himself, as it were, on the height of the Christian idea of creation *ex nihilo*, and surveys, in one wide sweep, all the consequences that seem to him to flow from this

principle in every department, whether of philosophy, or science, or polity. It is well-known what an impulse was given to the revolution of 1847-48 by his *Primato morale e politico degl' Italiani.* The proposition maintained in this eloquent book—that Italy, as being the custodian of the most ancient religious and moral ideas and the see of the Pontificate their interpreter and depositary, is the first nation in the world—was only a splendid dream; but the immense force with which this dream worked on the minds of Italians, creating in them for the moment a wonderful unity of aspiration, was due to its being the truest expression of the want which then began to make itself felt in every part of Italian life—the want, namely, to convert all the memories of our past into a living present power. Now the past, whose memory lingered most vividly in Italy, especially amongst the common people and the clergy, was that of our mediæval commonwealths united, in their best and earliest days, under the protecting power of the Pope. Turning, then, to this Guelph tradition, at once religious and liberal, and pointing to it as the only signal of concord between divided parties, as the only way out of the darkness of plot and conspiracy into the open light of a great and united national enterprise, the school of Manzoni and Pellico (with which also Cesare Balbo partly sympathised) was able, by help of Gioberti, to put itself at the head of the political movement of 1847, and to give it the first .and strongest impulse. Till then the Platonic-Christian Idealism of Rosmini had continued mainly speculative, or had only been able to lift a part of the clergy out of the Scholasticism of the Jesuits into a purer and freer thought. Through Gioberti it passed at once to the heart of Italian life, and diffused itself through a great part of society. The works of Gioberti, even the most abstract like the *Introduzione allo studio della filosofia,* being read and criticised from one end of Italy to the other, re-awakened the interest in speculative studies that had been slumbering so long. They also prompted a wider study of the works of Rosmini, which, owing to their somewhat severe and systematic character, were for long confined to a small circle of readers. Rosmini, who combated the doctrine of the temporal power of the Popes in his work *Delle cinque piaghe della Chiesa,* himself took part in the political events of 1848, when he was sent to Rome by Gioberti, then the minister of Charles Albert, to induce the Pope to take part in the war against Austria and to establish the bases of an Italian league. At that time Terenzio Mamiani was constitutional minister of Pius IX. These three leaders of our philosophical movement, forgetting the controversies that

had hitherto divided them, now worked towards a common end in the interests of Italy. For the first time in history there was presented the example of a revolution promoted by speculative ideas, in harmony for a time at least with facts, and going very far to realise the perilous Platonic ideal of a nation headed by a philosophical mind. Nor was this a merely accidental feature of our national revival; it was rather the ultimate expression of the most general fact embodied in it, at once supplying the key to its whole meaning and revealing the constant tendency of all the moral and intellectual forces in the country to subserve one great political aim—the attainment of unity and independence. Literature, operating through the classical and romantic schools of Parini and Alfieri onwards to Manzoni, Niccolini and Giusti, had paved the way for the revolution among the cultured and citizen classes; and in the same direction the people, the clergy, and even the Pope himself, were led under the combined influence of philosophy, literature and religious feeling.

II. The issue of that revolution is known to all. 1848 and 1849 mark an epoch in the history of our modern thought and literature, the effects of which are still felt by us. The deep sense of disappointment under the hard test imposed on the ideals of our poets and philosophers by the contact of events, and the new direction given to the National Union party after 1852 by the hand of Cavour, had a powerful influence on our literature in separating it entirely from politics, by which till then it had been dominated, and also on our philosophy in estranging from the doctrines of Rosmini and Gioberti all (especially clerics) who had given a welcome to them solely because they were a compromise between theocracy and liberalism, between religion and science. No sooner did this compromise appear to be, as it really was, an impossibility, and come under the condemnation of Rome, than timorous minds quitted the camp of philosophy for that of faith, the ranks of Christian Platonism for those of Aristotelianism and the Scholastic Thomism professed by the Jesuits, who had been combated to the death by Gioberti and in their turn had never ceased to combat him.

It was opposition of another kind that was offered to the doctrines of Rosmini and Gioberti by those who either had adopted them because they were an advance upon scholastic dogmatism in the direction of modern philosophical principles, or who had kept aloof from them in the very name of those principles. This opposition was all the more serious because it derived its force from the contradiction inherent in the doctrines in question—the contradiction, namely, between mediæval dogmatism and the critical spirit of modern philosophy,

between the principles of Catholic theocracy and those of liberal thought. These two irreconcilable elements had been, so to speak, laid the one above the other in the philosophy of Rosmini and Gioberti, but the dogmatic and theological element had greatly the preponderance. How this came to pass is easy to see. We were the last to join the movement of modern intellectual life, and, like a man awaking from a long sleep who takes a backward glance over the road already travelled before resuming his journey, our thought, which had hardly been awakened by Galluppi, turned with Rosmini and Gioberti to the philosophy of the Fathers and Doctors of the Church; for in them was presented a tradition of well-defined doctrine and the only tradition which since mediæval times had not entirely died out in our schools. Towards the close of 1834 Terenzio Mamiani, then an exile at Paris, set himself to take up again the thread of our traditional speculation at the point where it had been broken off in those philosophers of the fifteenth and sixteenth centuries who were the forerunners of the modern era. At that time Mamiani professed the philosophy of Experience (a doctrine nearly related to that of Galluppi), and in the name of this philosophy, which he thought more consonant both with tradition and with the genius of our people, he desired to wrest the direction of the Italian philosophical movement from the hands of Rosmini and Gioberti. But this design of his was not, and could not be, accomplished in the conditions of philosophical study then existing in Italy. The daring speculations of Leonardo da Vinci, of Bernardino Telesio, of Bruno, of Campanella, the predecessor of Bacon and Descartes, had not left among us any point of support, any philosophical tradition whatsoever to which this new intellectual movement might attach itself. The only philosophical tradition besides the Thomism professed by the Jesuits, which had never altogether died out in Italy especially among the clergy, was the Christian Platonism of the Fathers and Doctors, particularly St. Augustine, St. Anselm, St. Bonaventura, and to some extent also St. Thomas. It is well known how highly Vico esteemed Plato, and how much he meditated upon the Fathers and Doctors. Among the principal representatives of Idealism in union with Catholic doctrines, in the second half of last century, were Cardinal Sigismondo Gerdil (whose influence on philosophical teaching was felt chiefly at Bologna, Rome, and Turin), and Vincenzo Miceli, parish priest of Monreale in Sicily, where he had many disciples. If then it be remembered that in Italy even till well into the present century, philosophy had scarcely got out of the hands of the clergy and the seminarists; that to the clergy belonged Rosmini

and Gioberti, and the majority of their followers; and that one of the chief aims of the teaching of these philosophers was to bring about that reconcilement of reason with religious authority that had already been tried by the Scholastics,—it is not at all surprising that the theological element should be found to predominate greatly over the rationalistic. Excepting Galluppi, a layman, and one who keenly felt the influence of the Rationalism of the preceding century and of Kant's *Kritik*, we cannot say that either Gioberti (at least in his early works) or Rosmini himself, however much he owned to having received powerful impulses from Kant, was deeply impressed by the spirit of modern philosophy. Now and again they touch its threshold and cast glances over it, but they lack the courage to pass within. In more than one place in the *Nuovo Saggio* Rosmini is moved by an impartial love of scientific inquiry—that same speculative need which prompted Kant to ask: "How is the fact of knowledge possible?" But it is only in the external form and expression given to the critical problem, and in some of the conclusions arrived at, that he comes near to Kant. The substance and foundation of the *Nuovo Saggio* are drawn from the theological and dogmatic ontology of the Christian Fathers and Doctors. With them the author is substantially at one as regards the ruling *motives* of his inquiry, and he never allows the freedom of his thought to go the length of admitting that anything can be true to a philosopher which is incompatible with religious faith. That is to say, Rosmini regards the agreement of the latter with the results of philosophical investigation as a postulate. Gioberti, in his earlier works, goes even farther than this. Not only does he identify philosophy and religion, but he recognises in the spirit a faculty *sui generis*, superior to reason and having the supernatural for its object. Viewing the doctrines of Rosmini and Gioberti mainly from this point of view, Cousin, therefore, had ground for asserting that Italian thought was still "in the bonds of theology".

III. Of all our thinkers, Galluppi, is in many respects the one most penetrated by the secular and modern spirit. For him the examination of the validity and limits of knowledge is not merely the principal, but the only, question of philosophy—which he defined as "the science of human thought". A born psychologist, a clear, calm and rigorous reasoner, he directed all his investigations towards one object, namely, that of showing how from the feeling of the Ego and its modifications (identified by him with consciousness) come all the materials of our ideas, and how these, stored up by the imagination, and separated and combined by voluntary analysis and synthesis, build up the

whole system of our cognitions. This doctrine touches Kant's *Kritik* at some points, and resembles it in its more general features, but differs in its foundation, and still more in its conclusions. Galluppi does not allow that there are any true and proper *à priori notions* other than these two—desert and duty. The theoretic activity, according to him, is receptive and not spontaneously productive. The form of knowledge is derived and extracted from the matter of experience, which contains it, as it were, in germ; and though for the elaboration and transformation of this matter there is need of subjective elements, the *synthetic unity* of thought, presupposed by this elaboration, is based upon the *metaphysical unity* of the Ego, conceived as a thing-in-itself. Thus Galluppi's Subjectivism trenches on a psychological Realism, and he is brought near to Reid and the Scottish School, to whom he gave much study. Among his propositions, these two recur most frequently: "Sensation is objective"; "Thought is reality in itself". Galluppi had an extensive and precise acquaintance with the history of modern philosophy, and it is one of his chief merits that he was the first to introduce and diffuse its study in Italy.

In Rosmini and Gioberti, Critic is expanded and exalted into a true and proper Metaphysic; the doctrine of knowledge, or Ideology, while holding always the first place, is brought into close union with the doctrine of being, or Ontology. Of the two, Rosmini is more nearly related to Kant, alike in native intellect and power of introspective analysis, and in his way of setting forth and handling the critical problem. In this respect superior to Galluppi, who confounds consciousness with feeling, Rosmini sees with Kant that the whole problem of knowledge reduces itself to the inquiry how by the concurrence of sense and intellect things, which are apprehended simply as *representations* and *intuitions*, come to be understood, to be thought and *conceived* as *objects*, according to certain necessary and universal laws; that this *knowability* can come to things of sense only through the intellect and consciousness; that the union of the one with the other, of the matter of knowledge with its form, is possible only through the medium of a primitive judgment, of which the subject, particular and singular, is given by sense-intuition, and the predicate is furnished by the mind; wherefore, *to know is to judge*. Kant and Rosmini thus agree in keeping the critical problem within the limits of psychology; they both recognise the ideal form of knowledge as its true constitutive part; both regard synthetic *à priori* judgments as essential to its production. Rosmini, however, restricts these to one, while he gives to the form of knowledge an origin and a value very different from what the *Kritik* assigns. According to him Kant's capital

defect consists in not having reduced to a minimum the formal part of knowledge and in not having deduced it from a single principle. This is what the Italian philosopher attempts to do, and on this he grounds the claim he makes to superior originality in the *Nuovo Saggio.* He aims at showing that all Kant's forms and categories presuppose one single and simplest form, that, namely, of mere possibility and ideality, the idea of *indeterminate being,* which is inborn, and which becomes determinate in its union with the real, given by sensation. The essential constitutive act of all knowledge, therefore, consists of a primitive and direct synthetic judgment, in which the idea of existence is added as a predicate to sensation; an act, which is completed in intellectual perception, and is expressible by the formula—"That of which I am sensible exists".

So far the difference between Rosmini and Kant will not seem very great. But it becomes a substantial one, when we consider the value he assigns to the form of knowledge and the source from which he derives it. From this point of view the Italian philosopher is seen to be essentially dogmatic as regards both the ground and the spirit of his doctrine. In Kant, the doctrine of knowledge is the base and condition of the doctrine of existence; Metaphysic presupposes Critic. With Rosmini, the reverse order is the proper one. The end constantly aimed at by him is to establish the *reality* of knowledge, by giving to it an object that is necessary, infinite, and superior to thought. This object of thought, *the ideal indeterminate existence,* is divine in its origin; it is "the light which lighteth every man that cometh into the world". It acts as the mediator between our mind, which intuitively perceives it as a universal idea, and the reality of particular things, which comes to us solely by feeling. This doctrine, while it does not seem to me to succeed in establishing the objective truth of knowledge and inclines to a mystic Idealism, is yet far enough removed from the deeper meaning of the *Kritik,* to which, however, some of its Italian interpreters would fain accommodate it. The essence of the Kantian doctrine, as shown by Fichte, consisted in regarding knowledge and its laws as a product of the mind's proper activity. The Rosminian theory, on the other hand, really would make the divine light of intellect to descend from above upon the human mind, and by it be received and reflected on sensible things.

Gioberti, in the first form of his philosophy, started from an innate ideal intuition. However, in opposition to Rosmini, he maintained that as the divine ideal could not be manifested to us without a manifestation at the same time of the divine reality, the infinite *Ens* became the natural object of our mind

both as an idea and as a reality, distinct from finite *existences* yet so far related therewith as to produce them by free creation *ex nihilo*. This native intuition of creation, which reaches back to the first beginnings of thought, but which, though it is implied in every conception, is first clearly revealed to the matured and scientific consciousness that explains and demonstrates it, takes the form of a primitive synthesis, or first judgment, to which Gioberti gives the name of ideal formula: *The Ens creates the existent.* It is the *fiat* of Genesis placed at the head of all science. And it is to be noted, that while for Rosmini the synthesis of the ideal with the real is *effected* by the mind in intellectual perception, and sense-experience furnishes the second element; for Gioberti, on the other hand, this synthesis is *already given* as a primitive intuition, which containing it contains also the confused ideal apprehension of every finite reality, and becomes, if I might so call it, an *à priori* anticipation of experience. Feeling does nothing but add the fact of perception to these its prior and essential conditions. Thus the whole activity of scientific thought is reduced to the function of translating into reflective form the internal speech of an immediate and divine revelation, with which corresponds external speech—language that serves as an indispensable medium to the operation of reflection, and is itself of divine origin; for according to Gioberti man was created with the faculty of speech. It is easy to see, then, that for him science is essentially an *à priori* process, starting as it does from the Absolute, from the *idea*, which stands first in the logical and psychological order of cognitions. Further, the introspective inquiry into the facts of mind must reduce itself to a very small matter in a system whose principle is so far removed from experience, analysis, and accurate and patient induction.

In this respect, indeed, Gioberti's teaching marks a distinct retrogression in the history of our more recent thought. With Galluppi and Rosmini the faculty of observation and critical analysis is supreme, and some parts of Rosmini's *Nuovo Saggio*, and of his *Psychology*, *Anthropology* and *Logic* may rank with the best productions of modern philosophical thinking. Vincenzo Gioberti joined to some of the most brilliant qualities of the philosopher all those of the orator; great elevation of feeling; a wide and happy perception of the relations binding ideas and facts; a power of soaring to the highest pinnacles of thought, and thence taking in at a glance a vast range of practical applications and consequences; also, a great fervour and sincerity of convictions, which he had the art of communicating in their full intensity to the reader's mind. But with all these qualities, he had not the patient persevering force of thought

that advances with slow but sure step, and regards truth, not as a haphazard and fortuitous conquest, but as a legitimate possession, reserved for him alone who can vindicate his claim to it by the best reasons. No modern philosopher, not even Schelling himself to whom he bears some resemblance, delights more than Gioberti in imaginary syntheses, lacking the due preparation of careful analysis. Hence the cordial and, as Schopenhauer would say, the truly theological hatred with which he pursues psychology and psychologists, particularly Descartes, their father. The influence of the Giobertian school (which from 1842 to 1850 was considerably larger than the following either of Rosmini or Galluppi) was very hurtful in two ways. It diverted attention from serious and patient thought, and from the psychological inquiries started by Galluppi and Rosmini; while its return to the theological dogmatism of the Middle Ages could not but provoke a reaction as extreme as had been the enthusiasm with which it was originally embraced in the political excitement of the time.

IV. I have already pointed out that the occasion of this reaction was the events of 1848 and 1849, and that its true efficient cause was the contradiction that underlay the principles and elements composing the new Italian philosophy. What has been said is sufficient to show that the first impulse to this philosophy and the form of some of its principal problems were certainly derived from Kant's *Kritik;* but that the matter and spirit of its doctrines, with their tendency towards certain final conclusions, came to it from Catholic theology. The modern element overspread the old, but did not succeed in interpenetrating it. It has been said of Galluppi and Rosmini that they were Kantians without knowing it, and the observation, apart from the conclusions that are sought to be drawn from it, has a basis of truth; but the fact that, "without knowing it," they were in contact with modern philosophy, while they were moved by principles diametrically opposed to it, is the very reason why they are so far separated from it both in substance and in spirit. Nevertheless, theirs is the merit of having opened out for Italian minds a way by which to enter the current of modern ideas. They showed their countrymen what maturity of thought was necessary before they could assimilate the products of modern philosophy and civilisation.

The maturity of mind and culture developed in Italy especially during the second quarter of the century was not, however, wholly or even in greater part the work of philosophy and science, as was the case in Germany. With us it was mainly the result of political revolution and of the closer

sympathy which this set up between our national spirit and that of the other European peoples. The revolutionary movements extending from 1821 to 1847, the price we had to pay for the work of renovation that gradually penetrated to every part of Italian society, were the means of introducing modern principles; and this more by way of sentiment, literature and art, than of speculative and abstract thought.

After Genovesi, Romagnosi and Galluppi, who belonged rather to the age of 1789, philosophy long remained too much occupied with a priestly "vision of the Absolute and eternal ideas," to be able to appropriate whatever of a more modern, youthful, and promising spirit was stirring in the breasts of the new Italian generation, and stamping them with a mark of its own. This it was that caused the doctrines of Rosmini and Gioberti, notwithstanding the favour shown them at the beginning of the revolution of 1847-48, to have the power only of starting it, not of directing it, and still less of conducting it to a definite issue. Giuseppe Mazzini and, in a different way, the author of *Arnaldo da Brescia*, took from the outset a much clearer view of the course and probable outcome of Italian affairs. They felt that the principles with which philosophy, in Gioberti, had placed itself at the head of the national movement, no longer represented the deeper convictions of that portion of society which alone was fitted to conduct the revolution to an end and establish a new order of things. The ideas of the more youthful and energetic minds in Italy had kept pace with those of French society from 1830, while in those provinces of the north and south where the German philosophers were most studied the atmosphere of thought was very different from that in which the doctrines of Rosmini and Gioberti sprang up. Whether monarchists or republicans, classicists or romanticists, the "Unionist Liberals" were all agreed on one point—to break, with the past and with Rome in politics, and in philosophy to liberate human reason from every kind of religious authority and theological bondage. The Encyclical of the 29th April, 1848, revealing the impossibility of any kind of agreement between the Pope and the national party, only confirmed from without what had already been felt and foreseen by many. And, however the various parties might differ in their view of the means, the end that sooner or later became clear to the minds of all was the necessity of giving the lead of the national movement, in the order of ideas as well as of facts, to the secular principle: Rome must be left aside. This, which was really the overthrow of the political and philosophical creed proclaimed in Gioberti's *Primato*, was the program of the great Unionist party that from 1850 onwards had its centre in Piedmont, its arm in the Royal

House of Savoy, and its head in Cammillo Cavour. The fact that this party should, at so short an interval from the illusions of 1848 and 1849, have been able so clearly to see the goal towards which the nation was tending, shows how ripe was its consciousness of the new times, with their new needs and interests. But to my mind still more notable is the fact that the first inspirer and apostle of this new national enterprise, the unification of Italy through the instrumentality of the house of Savoy, was none other than Gioberti himself, who foretold it in his *Rinnovamento*, written at Paris, where he had gone on a diplomatic mission after the battle of Novara, and where he remained a voluntary exile till his death in October 1852.

V. Gioberti's posthumous works, the *Protologia*, published by his disciple, Giuseppe Massari, in 1857, made up though they be for the most part of fragments, and certainly containing no well-defined body of doctrine, yet suffice to show us how the same change that had come over his political ideas since 1849 had affected (but perhaps a little earlier) the foundations of his speculative thought. This change was not, and could not be, an evolution from the previous doctrines professed by the philosopher of Turin; it was rather their antithesis. In the *Rinnovamento* the headship of Papal Rome and the superiority of the spiritual over the temporal power, proclaimed by the *Primato*, gave place to the headship of Piedmont and the liberation of the State from the Church. In the *Protologia* not only was religion no longer, as it had before been, identified with philosophy, but it was entirely separated from it, and so far from the authority of faith being allowed to bear down the free examination of reason, it was put under subjection, reason being endowed with full power to interpret and explain from its proper data the existence and truth of religion. This new conception of Gioberti's in regard to the value and power of reason substantially modified his teaching, at the same time that it brought him very near to Hegel. To the Italian philosopher the Absolute Idea became what it was to the German—the essence and basis of things and of spirit. It is no longer opposed to finite thought, by which it is intuitively, though vaguely, perceived as an object superior and external to itself, but it is transformed into an absolute thought, which is inherent and immanent in human thinking, and creates it, or, as Gioberti says, posits it. The dialectic law of this absolute thought is the law of things and of being; human reflection, aided by language, only serving to translate the infinite idea into conceptions and their signs, without however being able at any time to reach its deeper meaning. In his doctrine of the creation likewise, Gioberti takes up different philosophical ground in the posthu-

mous works from that first occupied by him. While remaining faithful to his "ideal formula," and attempting every mode of escape from Pantheism, he admits the existence of a substantial relation between the world and God, who is for him the infinite in action, in whom the finite exists potentially as an indefinite possibility, previous to its determination outwards and its limitation in action. In its potential aspect, therefore, the Universe is God himself; and Gioberti does not hesitate to name it with Cardinal di Cusa "a potential God," a "*Deus contractus*".

This doctrine is a bold attempt to reconcile Plato with Hegel and with the principles of Christianity, from which Gioberti did not even now dare to break away altogether. The imperfect form in which it was left at his death, makes it impossible to say with certainty what place it might have come to occupy in the history of modern philosophy, had he been able to attain to a full understanding of the new direction and tendencies of his thought. But amid all the passionate disputing that goes on in Italy between those who deny any substantial novelty to the posthumous works, and those who would make out their coincidence with Hegelianism, one thing at least is clear, that in them the rationalistic element prevails greatly over the dogmatic and theological, however much the philosopher may still strive to reconcile the two. His mind, large as his heart, seemed destined to be the living embodiment of the mind of his country; and, just as between 1833 and 1846 his thought was crowned by the Utopian idea of an agreement with the past and with Rome that paved the way for the revolution by mediating between the clergy and the people, so now after the sad experience of facts he found himself irresistibly impelled to make common cause with those who had their gaze turned towards the future only. Proof of this appears in the friendship that bound him during the last years of his life to various republicans—among them Giorgio Pallavicino. The *Correspondence* of the philosopher with the democrat of Genoa, lately published at Milan by B. E. Maineri, is one of the most interesting books that can be read by those who desire to know thoroughly the latest period of our revolution. Between the author of the *Rinnovamento* and the young national party there was, however, one great difference, which Pallavicino has expressed by saying that he never could understand how the philosopher who could jest with him about the Eternal Father and hell-fire, should have had lying open on the bed, whereon he was found dead, the *Promessi Sposi* and the *Imitatio Christi*. It is clear that, however far Gioberti did advance in the direction of rationalism, he was never able unreservedly to accept or tranquilly to adopt all its principles and their consequences; and on the whole his posthumous works proved more a hindrance than a

help to Italian thought. Falling under the Romish censure, interpreted in quite opposite ways by Gioberti's old disciples and by the Hegelians, they indicated but did not throw open that new way which, without breaking the continuity of Italian thought, might bring it into relation with modern philosophy. They only served to bring out more absolutely the contrast between those who wished to keep our philosophy entirely separated from that of the rest of Europe, and those who were too eager to introduce a foreign element into it, without due preparation and without regard to the national genius.

VI. From what has been said up to this point it will be apparent, however, that such a contrast as this was inevitable, and that it was bound to manifest itself in full force after 1849, when the consciousness of modern principles and ideas, which had been at once a cause and an effect of our political movements, was revealed in all its fulness to a new generation, born and brought up in their midst. This result was greatly promoted by the study of foreign philosophies, especially that of Germany, which for more than twenty years had been prosecuted with an interest growing ever stronger with the development of our thought. Even before the year 1840, the Abate Alfonso Testa, of Piacenza, had combated the doctrines of our philosophers with the weapons of Transcendental Idealism, of which he published a critical examination in 1843. At Naples, where Galluppi, the first to diffuse the study of the English philosophers and of Kant, had taught, and where a contemporary of his, Ottavio Colecchi, of Abruzzo, had professed the *Kritik*, there began to be formed, shortly before 1848, a Hegelian school, which included the two brothers Silvio and Bertrando Spavento, Francesco De Sanctis, Cammillo De Meis, Antonio Tari, Niccola Marselli, and others of less note. These introduced Hegelianism not only into our abstract philosophical studies, but also, and in my opinion with greater fruit, into our literary and historical criticism. The school was scattered by the events of 1848. Some of its adherents languished for long in wretched prisons, where they sought comfort in philosophy; others betook themselves to Piedmont, and amongst these was Bertrando Spaventa, who remained there till 1860, and there published the first of his writings on the history of Italian philosophy. The judgment he then uttered—a judgment, however, which he afterwards substantially modified—was to this effect: "The Italian philosophy rejects the principle of the modern world, and denies science, for it denies the idea of the spirit as a thing identical with liberty, or rather liberty itself; it denies the absolute nature of thought, the dialectic essence of which is the very essence and dialectic of being; it denies the identity of the divine and

human nature," &c., &c. Thus wrote Spaventa in 1850, condemning the Italian school in the name of Absolute Idealism. In 1851 and 1852 appeared *La Filosofia della Rivoluzione*, by Giuseppe Ferrari (London), and *La Filosofia delle Scuole Italiane*, by Ausonio Franchi—two books in which the doctrines of Rosmini, Gioberti, and Mamiani were absolutely combated and refuted in the name of a critical Scepticism, which started at once from the principles of the *Encyclopédie* and from those of Kant. Differing in intellectual disposition no less than in the results of their doctrines, Ferrari and Franchi were at one in rejecting the speculations of our native philosophers as opposed to the spirit of modern philosophy. Ferrari, however, who in previous writings had confuted Rosmini, now adopted some of his psychological doctrines. Franchi's first work was a lively polemic directed against G. M. Bertini, then a follower of Gioberti, in which he condemned the doctrines not only of his adversary but of all the Italian schools, and summed up his opinion thus:—"Modern philosophy has not yet become possible in Italy".

Thus, of a sudden, after 1849, arose two diametrically opposite philosophical movements. On the one hand stood the schools of Rosmini and Gioberti, professing to be in harmony with faith —*Italianissimi;* on the other there was the Rationalism of the new followers of the German doctrines—Hegelians, Kantians, Sceptics. I designate the two opposed parties in this way, because it was the principle of national tradition, rejected by the one and exaggerated by the other, that mainly divided and still divides them. And indeed their relative position is such that it can be rightly understood only by those who look back to the intellectual and political conditions of Italy at that time. For, viewed solely in its speculative aspect, the difference between the two schools might have left some path open, if not for reconciliation, at least for peaceable co-operation in the same intellectual work—the development of our thought. They had more than one principle in common, and more than one point of contact with modern philosophy; whilst the grafts which modern thought had inserted into the old trunk of the scholastic mediæval tradition, whence sprang the doctrines of Rosmini and Gioberti, might perhaps have grown and spread till the whole had been renewed. But this could have come to pass only if the absorption of the modern elements by our national thought had been effected in a continuous manner, and if those who introduced the doctrines of foreign schools had first spent upon them the analysis and criticism necessary to render them fit for assimilation by the Italian mind. Now it so happened that neither of these conditions was satisfied. Rosmini and Gioberti

had distinguished disciples, but no true and proper successors; and the political and intellectual changes that went on after 1849 extinguished all the life and original activity in their schools. The disciples clung to the words of their masters, and rejected all innovation and all impartial study of foreign doctrines. The sentiment and the idea of "Italianism" in philosophy, which were certainly exaggerated by Gioberti but yet when he wrote had some justification, became in some of his followers a prejudice and a pretext for narrowness of mind and ignorance of all modern culture. And, on the other hand, most of those who at that time tried to introduce the German philosophy among us had no sufficiently broad and clear idea of the end they aimed at and of the means by which it might be reached; or, if they had such an idea, they certainly did not succeed in realising it. At the close of 1855, Ruggero Bonghi, the distinguished translator of Plato and Aristotle, in his youth the disciple and friend of Rosmini, and now one of the most illustrious of the writers and politicians of the moderate party, spoke in this strain:—"Those who now try to propagate and insinuate German doctrines in Italy do not seem to have sufficiently considered the natural difference between the Italian and German minds, and between the languages by which they are expressed". And elsewhere he speaks of them as "more inclined to appear profound than to make themselves intelligible". The upholders of Italian doctrines erred in despising the German philosophy, while they did not know it; the Hegelians and Kantians erred in wishing to make Italians think wholly in the manner of Germans. To many Giobertians and Rosminians the German philosophy appeared not only as the opposite of that professed by their masters, but also as the absolute negation of every religious and moral principle and of all science. In the eyes of Ausonio Franchi, on the other hand, Rosmini's system and Gioberti's first speculations were confounded with the Traditionalism of Father Giovacchino Ventura and the Scholastic Thomism of the *Civiltà Cattolica*, which had been started in 1850 by the Jesuits at Naples to support the reaction then in full course and the temporal power of the Pope.

The absolute impossibility of uniting to one end and in one common work the two opposite schools that thus struggled for supremacy in Italian thought, was made clear when Terenzio Mamiani founded at Genoa in 1850 an Academy of Italian Philosophy. During the five years of its existence this Academy grappled with various important questions, and helped by its valuable publications to promote among us the love of philosophy. It cannot be said, however, either to have given a vigorous mental impulse, or to have realised the hope of its

founder, that the best Italian minds might in this way be brought into a fruitful union of speculative and moral studies, and to an agreement on certain supreme truths, common to natural reason and philosophic thought, and forming, as it were, a perennial tradition of science raised above the contention of systems and schools. Even if such a general and indefinite aspiration could have been realised at all, it was little fitted, especially at that time, to give unity of direction to the efforts of an Academy which embraced men of absolutely contradictory opinions in philosophy. The struggle which they kept up for the leadership of Italian thought was one of life and death, admitting neither truce, nor compromise, nor reconciliation. The Academicians, as one of them, Bertrando Spaventa, said, had nothing more in common than their assembly-hall. There they met, and called each other friends, colleagues, associates; but with the best intentions in the world they yet could never manage to understand one another. They formed an Academy of Italian Philosophy for the simple reason that they were born and settled in Italy. So far the Academy only too faithfully reflected the state of minds throughout the country.

VII. The founder and president of the Academy, in his desire to imbue it with a broad and conciliatory spirit, began from that time to put forward the doctrines to which he had himself been led by a slow evolution of thought through the various phases of the philosophical movement started by Galluppi. A follower of the experimental school during the first years of his exile in France, Count Terenzio Mamiani had gradually made his way towards an idealism, which, without losing sight of the national tradition and of Christianity, aimed at becoming entirely independent of revelation and theology. This rationalistic tendency became more and more manifest in Mamiani's writings; and succeeding, as he did on the death of Rosmini and Gioberti, to their position of influence, he has given a very powerful impulse to the national thought. To the authority exercised by his genius, his teaching, and the purity of his political life, Mamiani, as a writer and philosopher, adds the attractions of an artist. An elegant poet and polished prose writer, he has ever been the most illustrious representative of that classical school which was headed by Alfieri and which, by going back to the forms of antique art and the study of the men of the thirteenth and fifteenth centuries, re-invigorated the national sentiment by means of literature. Of this school Mamiani has in all his writings been, so to say, the philosopher; his ideal always being that close union of Christian and modern thought and feeling with the forms of antique art aimed at by those writers of the Renaissance, with whom, as I have before

said, he seeks to restore the continuity of philosophical tradition. Among his works composed at the time of full vigour, two in particular reveal this intention, and have procured him the greatest amount of fame—*I Dialoghi di scienza prima*, where he happily imitates Plato; and the *Inni sacri*, in the manner of Homer and Callimachus, but with their subject borrowed from the Christian legends so intimately bound up with the traditions of our country and people.

Mamiani professes himself a Platonist, in as far as he maintains, contrary to all critical and empirical schools, the absolute objectivity of ideas. And the fact that he has by new arguments demonstrated this objectivity and placed it beyond the pale of doubt, constitutes, as he believes, the chief claim of his doctrine to stand as true and original. It does not, in his opinion, contradict the doctrines of Rosmini and Gioberti, but completes these while tempering their excesses, and thus it closes the period in our speculation which opened with Galluppi.

His doctrine of consciousness is directed towards the same end that Rosmini and Gioberti had in view when they combated the *Kritik*—namely, to prove with full certitude that we apprehend directly the infinite reality and the finite reality. It thus reduces itself to two main points, *perception* and *intelligence*, or *ideal vision*, and is wholly dependent on two principles, whereby Mamiani seeks to reconcile Plato and Aristotle: Every universal is *ante rem;* Every cognition is *post rem.* In other words, every idea considered in itself is universal, necessary, immutable, and, as such, *objective*, independent of thought, and underived from sense: and on the other hand, no idea is innate—all are preceded by sense-perception, which is the occasion of their appearing before the mind and being determined as the truth of the things presented by experience. Thus, by means of ideas as well as by sense-perceptions, human consciousness receives into itself the real, the *noümenon.* Like Reid, Mamiani excludes from perception all intervention of conceptions and representative ideas. It is according to him an immediate relation of the spirit with reality; it is an act *sui generis* and in the highest degree simple; a mental intuition, by which in our sense-affections we are made aware of the *action* of the exciting forces and substances. Such an action is *involved* in the passivity of sensation, and is perceived by us in conjunction therewith, but we cannot by means of this inward intuition penetrate to the substances which operate upon us. They and our spirit, which sometimes modifies them and sometimes is modified by them, are joined in a relationship, in which the acts only

are united and reciprocally penetrative, while the substances and subjects remain incommunicable.

To this relation, which unites our spirit to sensible reality through experience, there corresponds another which unites it to absolute reality through ideas. The idea, according to Mamiani, is *the Absolute in as far as it appears and announces itself to the intelligence;* it is the *mental form* of the Absolute, which is determined in particular ideas, each of the latter expressing *ad intra* the eternal possibility of a finite thing, and *ad extra* its concrete reality, which however is *given* only in the fact of experience. Thus in the truth of ideas the mind intuitively perceives the real existence of the Absolute, but it apprehends only its *presence*, and, as it were, touches its surface without being able to pierce with the eye to its mysterious depth, or to comprehend its perfections and attributes, which are represented by the ideas only in a symbolical and analogical fashion. In this, as in other parts of his doctrine, Mamiani takes a path midway between Rosmini, who denies to man the intuition of absolute reality, and Gioberti, who goes so far as to concede to him the perception of the divine substance. He has tried with all his might to fix the extreme limit of the mind's intuition of the Absolute; but (as might be expected) has been able to give a merely imaginative representation of it.

The fundamental doctrine of Mamiani, and the point towards which he has rallied all the powers of his mind, is the demonstration of the real presence of the Absolute in the ideal representation—a demonstration which at bottom is the celebrated argument of St. Anselm, modified and reproduced in a new form. Mamiani wishes to prove that every idea (and not merely the idea of God) includes a necessary truth, which, as such, is inseparable from an eternal, absolute, and self-existent object. The unity of ideas constitutes the totality of truth, which is therefore inseparable from and convertible with the reality of the Absolute. Assuming the Principle of Contradiction, he maintains that, if every necessary and absolute truth did not subsist in a real eternal object, it would become contradictory, for it would both exist and not exist at the same time. However, he does not pretend to *deduce* the existence of the Absolute from a higher principle; he only wishes to prove that it is the postulate and condition of every ideal truth (not excluding the Principle of Contradiction itself), and that thus the Absolute is immediately and intuitively perceived by us.

Mamiani has written a Cosmology, which he thinks the most novel part of his philosophy and by which he intended to supply a substantial defect in the systems of Rosmini and Gioberti. The following are some of its chief features. Starting from the

idea of the good and its relation to the creative act, which he regards as necessary, he thence advances to the conception of the world as an indefinite multitude of monads, or simple activities, which act upon each other, and are united under the active influence of the infinite, whose perfections they come to share by an indefinite progression thitherward. This cosmic progression Mamiani tries to demonstrate *à priori*, by basing it on the idea of the infinite as well as on that of nature; then he traces it up to the highest grade of things, to wit, the region of moral existences, which are immediately subject to it. Having thus raised himself to a philosophy of history, whose fundamental conception is the *organic unity of mankind*, he sets himself to enumerate the laws of its development, and the forms it has assumed in different nations and in their mutual historical relations. The Italian philosopher's speculations on the subject of the vicissitudes and destinies of mankind, though preceded by those of Vico and Romagnosi, are in part original. They find their completion in the doctrine set forth in his work *Di un nuovo diritto europeo* (1859), which was translated into French, and is well known outside Italy.

His general philosophy may be studied in his *Confessioni di un Metafisico* (1865), in his *Meditazioni Cartesiane* (1869), and in his last work, *Compendio e Sintesi della propria filosofia, ossia nuovi Prolegomeni ad ogni presente e futura Metafisica* (1876). Except on the one head of the relation of philosophy to faith, his doctrine has a common origin with the systems of Rosmini and Gioberti, and it leans towards mysticism by reducing the mind's activity in cognition to very small limits. Its psychological basis is rather weak, and in this respect it is inferior to the doctrine of Rosmini.

Mamiani is a man of a lively and versatile mind, and of an indefatigable activity. Professor of Philosophy of History in the University of Turin from 1837 to 1850; in 1860, Minister of Public Instruction in the first Italian Cabinet, presided over by Cavour; next, Italian Ambassador in Greece and afterwards in Switzerland; then Councillor of State at Florence and now at Rome, he has until last year taught in the Athenæum of the latter city, and is at the present moment one of the most active workers connected with the *Filosofia delle Scuole Italiane*. This Review, which is known to the readers of MIND, is the most important of the Italian periodical publications devoted to philosophy. Mamiani's fellow-workers have full liberty of thought and discussion, but though some of them profess very different doctrines from his, they rally round him as the most influential representative of that speculative movement which helped forward our national resurrection, and awoke us from an

intellectual torpor of more than two centuries. Mamiani's labours within this movement would, I believe, have had much more effect, if he had professed all along in his writings a well defined doctrine, and if in the excess of his attachment to our traditions he had not too rigidly condemned all foreign philosophy, especially that of Kant. Notwithstanding this, however, he certainly cannot, as many others of our philosophers can, be charged with having refuted modern doctrines without knowing them. The spirit of free yet conscientious criticism which characterised his first onslaughts on Rosmini and Gioberti, has remained with him throughout the long controversy which as an old man he has maintained with the Hegelians and Positivists, while the activity of his mind has only increased with years as he has seen the adherents of a purely Italian philosophy range themselves about him in two sections; on the one hand being the avowed opponents of Hegel and Comte, on the other those who without swearing to their words are yet eager to assimilate the results of modern thought.

VIII. Of the latter section of thinkers several have been invited by Mamiani to co-operate in the *Filosofia delle Scuole Italiane*, and they have taken part in it to a considerable extent. Among the most notable of these have been G. Battista Bertini and Francesco Bonatelli. Bertini, who died a couple of years ago, was a man of acute mind, and a most earnest searcher after truth. After his first work, *Idea d'una filosofia della Vita* (1850), which Franchi took as the subject of his criticism, he wrote no more purely philosophical books; but it is certain that with ripening knowledge he drifted away from the doctrines of Gioberti more and more in the direction of a rationalistic theism, which to some extent agreed with the theism of Mamiani, though it was more largely influenced by modern philosophy, especially that of Germany. A learned Hellenist and vigorous critic, Bertini turned his attention chiefly to the History of Philosophy. His work on the Greek philosophers anterior to Socrates, based on the text of the fragments collected by Mullach, is our best work relative to that period of ancient speculation. He was particularly interested in morals, and in the religious problem, on which he wrote at length and had much discussion with Mamiani, who has often treated the subject in the *Filosofia delle Scuole Italiane*. His posthumous work, *Il Vaticano e lo Stato* (1877), recommends to enlightened and liberal Catholics a reform that should purify their religion and aim at bringing it into harmony with reason and the moral sense. Bertini was professor of History of Philosophy in the University of Turin.

Bonatelli, professor of Philosophy in the University of Padua,

belongs to the Herbartian School, from which he has borrowed in particular his psychological doctrines, while endeavouring to bring them into harmony with the autonomy of moral acts and with religious faith, which he professes with the deepest conviction. His two principal works are *Pensiero e Conoscenza* and *La coscienza e il meccanismo interiore*, to which he has lately added a long essay on Hartmann, show him to be possessed of a refined if not original mind, with much acuteness of observation and a sound knowledge of the History of Philosophy.

Much nearer to Mamiani stands Luigi Ferri, professor of Philosophy in the University of Rome. Having prosecuted his early studies at the École Normale of Paris, he was confirmed in his natural bent for psychological observation and for that accurate historical analysis of systems of which the French have furnished us with many examples. Ferri adheres substantially to the Idealism professed by Mamiani, though with a certain reservation as to the psychological portions of that doctrine, to which he would give a more solid basis by the study of the phenomena of consciousness. What conclusions he may ultimately arrive at by this study, which seems to me to indicate a change in his thought brought about by the German and English psychology, do not yet appear. Ferri's principal work is the *Essai sur l'histoire de la Philosophie en Italie au dix-neuvième siècle* (1869), and it is certainly the most complete and solid history that has yet appeared in regard to our contemporary philosophy. Here it is faithfully delineated both in its inner development and in its relations to Italian political movements and to the part played in them by our philosophers. And yet the author, I think, is open to the charge of having represented these as more in unison than they really were with the spirit of Modern Philosophy, and of having exaggerated its influence on the dogmatic and theological element in their doctrines. Ferri has also given much study to the philosophers of the Renaissance. His latest work is the publication of the MS. of a treatise by Pomponazzi, *In libros de Anima*, discovered by him in the Angelica Library at Rome, and elucidated in an important memoir, wherein he maintains that Pomponazzi's doctrine and his interpretation of Aristotle's theory of the intellectual soul never varied. On this subject he has recently engaged in a lively polemic with Prof. Fiorentino.

Domenico Berti, a man of much influence from his genius and learning as well as the position he holds among our politicians of the moderate party, is specially known by his historical labours. At first a teacher of the doctrines of Rosmini in the University of Turin, he has gradually arrived at the conception of a close harmony between philosophy and the results of the

natural sciences. But he has rather indicated than formally expounded his philosophical opinions, and he is best known by his *Vita di Giordano Bruno*, a solid piece of work that throws much new light upon the mind and labours of the unfortunate philosopher of Nola. It was the author's intention to follow up his biography of Bruno by the exposition and criticism of his doctrines, but as yet the promise remains unfulfilled. Berti was professor of History of Philosophy in the University of Rome till a year ago, and is the author of two other important works on the philosophers of the Renaissance. One of these is entitled *Copernico e le vicende del sistema copernicano in Italia, nella seconda metà del secolo XVI. e nella prima del XVII.*, &c. (1876); the other, *Processo di Galileo Galilei pubblicato per la prima volta* (1876). The latter has been subjected to very severe criticism by German scholars, calling forth Gebler's recent publication, *Die Acten des Galilei'schen Processes, nach der vaticanischen Handschrift herausgegeben* (Stuttgart, 1877). Berti was for some years Minister of Public Instruction.

By the side of these men, who without cutting themselves off from the Italian speculative tradition are more or less in contact with the method and principles of Modern Philosophy, are some others, who either continue to follow the doctrines of Rosmini and Gioberti, or who, rejecting its systematic form, adhere to its dogmatic and theological substance and to the postulate of a necessary agreement between reason and faith. At Turin Rosmini's doctrine had from the first one of its main centres; and there it was long taught by G. B. Peyretti, lately dead. He and Profs. Pestalozza and Corte have expounded it in an elementary form, and their manuals have been adopted as text-books in most of the Lyceums of Piedmont, Lombardy, and Tuscany since 1860. In the University of Pisa the Rosminian doctrine is at present professed by Paganini, author of a work that treats of its relation to theology. In the southern provinces the philosophy of Gioberti's first works is still professed by some, chief among whom are, in Sicily, the Abate Vincenzo Di Giovanni, professor in the Lyceum of Palermo, author of numerous careful works on the History of Philosophy, and at Naples by the Abate Vito Fornari, an imaginative and elegant writer, more of a theologian than a philosopher, and known by his *Dialoghi dell' Armonia universale* (1862), by a treatise on *L'Arte del dire*, and by a *Vita di Cristo*, of which only two volumes have as yet appeared. Formerly a pupil of Fornari, and now a professor in the University of Bologna, Francesco Acri has given proof of a rare knowledge of German doctrines and of the history of philosophical systems, in regard to which he has in various writings emitted certain novel and rather noteworthy ideas.

In Tuscany, where there is some repugnance to speculations of too abstract a nature, and where the school of Galileo by means of the Accademia del Cimento created a strong tradition of experimental study, a ready welcome was given to Galluppi. Later arose some followers of Rosmini, chiefly attracted by his psychological doctrines. The philosophy of Gioberti, especially that of his first writings, has been taught from youth upwards by Augusto Conti, now professor of Philosophy in the Higher Institute of Florence, and well-known outside of Tuscany. A Catholic by conviction and sentiment, and, like Rosmini and Gioberti, nurtured in the study of the Fathers and Doctors, he professes doctrines that accord with the main truths of Christianity, while they are declared by him to be contained in the natural consciousness of every man, so as to need only recognition from science. Philosophy, according to him, presupposes and has for its material the *natural certitude* of truth given to us by the three relations of thought—to mind, to human society, and to God. These relations provide the philosopher with five criteria, namely, evidence and the love of truth, the authority of common sense and of the learned, and the authority of Revelation. Evidence is the primary criterion; the others are secondary and subsidiary. This doctrine, expounded in the work entitled *Evidenza, amore e fede o i Criterii della Filosofia* (1872, 3rd ed.), is substantially at one with that of Rosmini and Gioberti as to the necessity of making its ultimate agreement with revealed truth the postulate of every scientific demonstration. Conti, however, goes farther than this, and not only does he not recognise any natural intuition of God, or of divine ideas, but he would make Philosophy entirely independent of any kind of systematic form, by distinguishing the truths which he calls *substantial and theorematic*, as being naturally known and demonstrated and beyond the pale of doubt, from the *problems*, which are given over to the examination and judgment of philosophers. In what way and how far he would thus restrict the liberty of scientific reflection and lower its value, does not sufficiently appear; there is, however, according to Conti, a "perennial and progressive Philosophy," which is not to be confounded with sects and erroneous systems. The latter confound and derange the order of the truths of consciousness, which they fail to comprehend in all its relations; the former faithfully traces out this order without confounding or denying it in any part. Philosophy is "the science of God, of the world and of man in their universal order, present to human consciousness"; its true method consists in the recognition of the nature and sequence of the universal relations existing between ideas and things, setting

out from the examination of inner facts, and rising thence to the highest notions of the True, the Good, and the Beautiful, and lastly applying these to the scientific knowledge of God, the world, and man, and to the reasoning of the three arts, Logic, Æsthetics, and Morals. This large design has been realised by Conti in a series of works (9 vols.) comprehending Elementary Philosophy and Higher Philosophy, divided into Dialectics, Æsthetics, and Morals. He is besides the author of a *History of Philosophy* (the only one yet written in Italy), in which he follows out the "perennial tradition" of speculative thought, and, distinguishing it from the "sects" which deny and modify natural and revealed truth, finds its completest and highest realisation in the Fathers and the Doctors of the Church, especially St. Thomas. Conti exercises a great personal influence by the precision of his thought, his remarkable power of expression, and the strength of his convictions. His *Elementary Philosophy* is taught by many disciples in our Lyceums.

IX. At the head of the opposition, by which the doctrines of Rosmini, Gioberti, and Mamiani have found themselves confronted since 1850, stand, as I have already said, the Sceptics and Hegelians. Sceptical criticism is represented by Ferrari and Franchi. At bottom the doctrine expounded by Ferrari in his *Filosofia della Rivoluzione* is the phenomenalism of Protagoras, reanimated by the Criticism of Kant and the Empirism of the eighteenth century. The conception round which it moves is that of the perennial incessant change pervading everything, facts as well as ideas, Logic as well as Nature. For, on the one hand, says Ferrari, the very logical laws, which would seem to reveal to us a close relation of identity between the essential elements of our ideas, are vain and fallacious, and, when subjected to analysis, disclose irreconcilable antitheses and antinomies; and, on the other hand, everything in Nature is subject to change, alteration, contrast, and thus is averse from that unity which thought looks for in facts by representing them to itself and explaining them scientifically by their laws. Contradiction is therefore the law of being, and should be accepted without any attempt at its removal. Antinomies do not, as Kant sought to prove, occur only in the principal ideas of reason, but also in all ideas, and in all facts, and furthermore between ideas and facts; so that Logic and Nature are contradictory in themselves and between themselves, and thought, which would dominate facts by applying itself to their real elements, is of necessity involved in error. Ferrari consequently entirely denies the possibility of science, and concludes that all we have to deal with is facts, or rather their appearances (existence and appearance being the same), and that

thought, so far from wishing to dominate phenomena, should be subordinate to them, and confine itself to the examination of their infinite varieties and contrasts, accepting, without pretending to penetrate, the hidden revelations of Nature. Thus by an opposite route Scepticism arrives at the same point as theological Dogmatism—sentiment and faith, the *credo quia absurdum* of Tertullian, a maxim often repeated by Ferrari. He is best known by his works on the Philosophy of History, and by his doctrine of "political periods," with which he tries to measure arithmetically the different phases of the life of nations. A pupil of Romagnosi's, long resident in France, where he was much appreciated, he returned to Italy in 1859, was professor of Philosophy of History at Milan, Florence, and Rome, and a deputy of the Extreme Left till his death last year. Ferrari was a man of a powerful and original mind, but undisciplined and impatient of the rigorous examination of facts, so that also in his political forecasts he often went astray.

Owing to the very abstract form of his doctrines, Ferrari has exercised but little influence among us. It has not been so with Franchi, a lively and exact writer, ever aiming at one object—the utter demolition of what he was the first to call the Philosophy of the Italian Schools, and which he identifies throughout with the Scholasticism and Theology of the Church of Rome. I have already allowed that there is a foundation of truth in this harsh judgment of Franchi's; but yet he goes too far, and, looking only to the substantial agreement between Italian doctrines and Catholic dogma, he fails to take sufficient account of the elements derived from Modern Philosophy, of the impulses given by Galluppi, Gioberti, and Rosmini, and, above all, of their historical value as paving the way for the national revolution and arousing us from our secular slumber to a new life of thought and action. To condemn them, however, without appeal, it is enough for Franchi that they should substantially agree with the Catholic creed, no matter what amount of liberty of thought and inquiry and what rigour of method our philosophers may have employed. In this intemperance of criticism we recognise the truest expression of the negative reaction that followed the attempt made by Rosmini and Gioberti to reconcile Catholicism with Philosophy. The reaction was all the greater in Franchi's case from the depth and passionateness of his early faith; for he was educated in an ecclesiastical seminary, and wore the priest's habit before laying it aside when severe inward struggles landed him in Rationalism: he dropped also his very name of Cristoforo Bonavino, calling himself henceforth Ausonio Franchi. His other works, besides the *Filosofia delle Scuole Italiane,* are *La Religione del secolo*

XIX., the *Razionalismo del popolo*, the *Sentimento*, two volumes of *Lezioni sulla Storia della Filosofia moderna*, and the *Teorica del Giudizio*. In this last he criticises the synthetic judgments *à priori* of Kant, and expounds the docrines of the philosophers who have treated of the subject. Born for controversy, which he manages with rare skill and vigour, Franchi, as a philosopher and psychologist, has no doctrines of his own, and fluctuates between the Criticism of Kant and a mild Sensationalism, in which feeling is substituted for sensation as the basis of the phenomena of consciousness. His thought borrows force and life from the ardour of his convictions, which however is prone to excess and gives to his style a declamatory tone. He is a professor in the Scientific and Literary Academy of Milan.

Franchi has followers in various parts of Italy; but he has not, nor ever could have, a school. In fact the only speculative doctrine, opposed to that of our philosophers, which has formed a school among us is Hegelianism. Started in Naples previous to 1848, it has flourished there since the political overturn of 1860, and now has its centre in the University, where it is taught by Augusto Vera and Bertrando Spaventa. Of the two, Vera is the true and leading representative of the school, both because he professes its doctrines more faithfully, and because to his influence as a teacher and writer he adds the authority of a name well-known beyond Italy. There is no need to mention to the readers of MIND the many writings by means of which the translator of Hegel has so powerfully aided in the diffusion of his doctrines both in Europe and in America; for he has not limited himself to illustrating and defending these, but has also to some extent developed them by thought of his own. Among contemporary philosophers Vera is one of those who have cut themselves most adrift from the idea of nationality, though he did publish some years ago an important work on one question of special interest to Italy—the freedom of the Church in relation to the State. He has always refrained from any direct examination of the doctrines of our philosophers, to whom he allows no speculative value whatsoever. This severe judgment on Galluppi, Rosmini and Gioberti finds expression in a work, entitled *La Philosophie contemporaine en Italie; Essai de Philosophie Hégelienne* (Paris, 1868), written by Raffaele Mariano, a pupil of Vera's, and the author of other works, in which the principles of Hegelianism are applied to the religious and political problems of our time. Among the followers of Hegel we should mention also the late Marchesa Marianna Florenzi Waddington, a lady of the highest culture and the author of various works, in one of which an attempt is made to

reconcile the doctrine of the immortality of the soul with the principles of absolute idealism.

The theoretical and doctrinal part of Hegelianism, however, has been of less account among us than the applications made of it in the field of historical and critical studies, which have been to some extent revived by its influence. Did space permit, I might speak of Francesco De Sanctis as one who under inspiration from Hegel led the way to a broader and more philosophical literary criticism than reigned in our schools in the first half of the century. Moreover, Hegelianism has, though in a less degree, influenced the relations of philosophy to the physical sciences, as shown in the writings of Cammillo De Meis, professor of History of Medicine in the University of Bologna. His aim has ever been to harmonise the speculations of philosophy with the results of experimental research. Thus in his work, *I Tipi animali* (of which as yet only one volume has appeared), he proposes a solution of the problem of the variation of species which, without repudiating the empirical data of Darwin's discoveries, would subject them to the superior requirements of a strictly scientific demonstration. The work to which De Meis chiefly owes his fame is his *Dopo la Laurea*, a kind of autobiography descriptive of his youthful studies and the state of his mind on quitting the University. It gives a vivid picture of the Italian mind between 1848 and 1860.

I have already appealed to the judgment of one of our most illustrious living writers, Ruggero Bonghi, as to the reason why the labours of the Hegelian school have borne less fruit among us than might have been expected. The merit that certainly belongs to it of having brought Italian into immediate contact with German thought, of having infused into the inert mass of our philosophical studies a new vein of stirring and refreshing ideas, of having for the first time opened out to our view the broad prospect of that historical method which is the glory of modern science—this undeniable merit of the Hegelian school would have seemed to the impartial historian all the greater, had more account been taken by it of the natural and traditional disposition of the Italian mind, and had the attempt not been made to introduce foreign ideas among us as if they were so much merchandise. Moreover it dogmatised at least as much as its opponents, and that too at a time when it ought rather to have trained our minds to that critical analysis and those psychological inquiries from which alone we could derive solid preparation for the modern scientific method. But indeed in Italy our minds were so little inclined to criticism that it was very natural, or I might say necessary, for many to pass *per*

saltum from the theological dogmatism of the ontologists to another dogmatism of an opposite but no less absolute kind; and even now, though the most faithful followers of the Hegelian school have dropped many of their southern fancies, the identity of being and not-being and the evolution of the Absolute are regarded as the last word of science—as so many articles of faith. This, it will be said, is a necessary consequence of the systematic spirit. The evil, however, was that, whereas for the Germans Absolute Idealism was the last stage of one of the broadest and most liberal speculative movements on record, for us, on the other hand, it was only an importation, accepted for the most part by its followers without examination, and for no other reason than that it represented a faith opposed to that which had hitherto been preached to them; accepted too as the latest outcome of modern speculation, though the doctrine was already superannuated in Germany, and no longer responded to the needs of European thought.

Bertrando Spaventa saw this more clearly than any of the other Hegelians. Stepping in between the partisans of an exclusively national philosophy and the strict Hegelians, who took no account of our intellectual traditions, he recognised the need of linking our thought once more to that of the other nations of Europe, whilst, at the same time, he clearly saw that we could enter into the spirit of Modern Philosophy only by preserving the consciousness of our speculative thought in its entirety and in all its historical continuity, and by taking up again the thread of our philosophical tradition at that point where it had been in relation with the thought of other nations. The same position had been already maintained by Mamiani as against Rosmini; but it was taken up anew by Spaventa, after 1850, and defended with much power. In his view our philosophers of the Renaissance mark the point in history to which Italian thought must turn to find again the consciousness of itself and of its traditions, and above all Giordano Bruno and Tommaso Campanella are important as initiators of modern thought. He regards Bruno as the precursor of Spinoza, and Campanella as the precursor of Descartes. In Vico, who followed these at a long interval and rose to a general conception of man and history, Spaventa sees the final outcome of their doctrines, and an indication from afar of the Idealism of Kant.

This view has been traced by Spaventa in one series of his *Saggi*, which throw much light upon the history of modern philosophy, and are certainly the best of his writings. These are only one part of his work, however; the other being given up to an attempt to discover in the doctrines of our latest philosophers, especially Gioberti, an intimate connexion between

Italian speculative thought and modern philosophy. I have already remarked that in his earliest writings Spaventa agreed with Vera and the other Hegelians in excluding Galluppi, Rosmini and Gioberti from the history of modern speculation. But he confesses that riper study has convinced him that our philosophers not only felt Kant's influence, but were, unknown to themselves, urged by an irresistible logical necessity to the same critical results; that Galluppi was a Kantian without being aware of it; that Rosmini gave to the problem of knowledge the same solution as Kant; and finally that Gioberti is in his early works a Spinozist, in his posthumous a Hegelian. Such are the main conclusions reached by Spaventa in that part of his historico-critical essays, where he searches out and not seldom finds the subtlest analogies between the speculations of Italian and Germany philosophers; but here his criticism is undoubtedly at its weakest. That our philosophical thought indeed was influenced by the same speculative needs as had determined the *Kritik* of Kant, and that especially Galluppi and Rosmini, in applying themselves to the problem of knowledge, were so far linking themselves to modern Philosophy, are facts which no impartial critic would deny. But that Rosmini and the author of the *Primato* can be called Kantians or Hegelians, that the matter and, what is of more consequence, the spirit of their speculations substantially agree with the modern German philosophy, are what no criticism, however ingenious, will ever succeed in proving.

As a philosopher, Spaventa has no doctrines peculiar to himself. Substantially he is a follower of Hegel, but this does not prevent him from adopting any good thing that other schools may offer, as, for example, the Herbartian, whose psychology he highly appreciates. But it is in the field of critical History of Philosophy that he has exercised most influence as a teacher and a writer. His ideas in regard to the philosophers of the Renaissance have found their most faithful interpreter in Francesco Fiorentino, professor in the University of Pisa, and best known by his two valuable works on Pomponazzi and Telesio, which are both marked by care and originality of research in regard to the schools of Padua and Cosenza. Fiorentino has also recently published a book of *Elementi di Filosofia*, for use in the higher instruction, in which, while substantially following Kant, he partly adopts in psychology the doctrines of Herbart, and in logic the theories of Mill. He is conductor of the *Giornale Napoletano*, which in its philosophy represents the views of Spaventa's followers.

X. In Italy as elsewhere the advance in historical and critical studies is bound up with the rise and spread of the Positive

Philosophy. I purposely make use of the term Positive (which in England is rejected by Experientialists) for two reasons: first, because the positivist doctrines came to us directly from France, being from the first nothing but an echo of Comte's ideas; and secondly, because, in regard to the meaning of the word Positivism, there has been, and still is, in the minds of many in Italy some confusion of schools and doctrines that are at one in rejecting metaphysics but in other points are widely different. This confusion is to be attributed rather to the meagre philosophical culture of the Italian people, than to any fault in those who first introduced the new doctrines among us. Before 1870, attention had been drawn to these by Pasquale Villari, the well-known historian of Savonarola and Machiavelli, in an essay published in the *Politecnico* of Milan, and by Aristide Gabelli in his work entitled *L'Uomo e le Scienze morali*. Both these writers, but especially Villari in his historical studies, adhere substantially to the doctrines of Comte, while endeavouring to harmonise them as much as possible with the tradition of our experimental schools. Till a few years ago, however, the literature of the young Italian Positive School was not of much account; not that there was any lack of writers, but they did not form a true and distinctive school. Without any clear or definite notion of their philosophical tendencies, they lost themselves in useless generalities about method, categories of cause, substance, being, &c., and declaimed against the doctrines of their opponent without inquiring whether in the field of Experiential Philosophy and with the aid alone of scientific method, it were possible, or had elsewhere been tried, to give a doctrinal form and development to Psychology and the other moral sciences. The new and fruitful direction which these had taken in England, without abandoning the tradition of the school of Locke, Hume, and Hartley, was almost unknown in Italy till shortly before 1870; the number of readers of Spencer, Bain, or Lewes being very limited, while Stuart Mill was known chiefly by his *Liberty* and his economic writings.

The extension of the national culture and the new impulse given to philosophical studies by advance in the historical and physical sciences have contributed much to change this state of things. The influence of the doctrines of Comte, an almost absolute one at first, has been superseded in our Positive School by that of the English philosophy. And now it may be said that the latter is more known and studied among us, especially by the general body of the intelligent public, than is the German philosophy. The followers of the latter are to be found chiefly in the universities, while Mill, Spencer and Bain are the names of highest repute amongst our most cultured classes and the

students of the historical and social sciences. I will not say, however, that these, or at least the greater part of them, fully understand the position of the English Experiential School, or its relation to the history of contemporary philosophy—to Empirism and Materialism on the one hand and to metaphysical and theological Dogmatism on the other. For it is not unusual to find Büchner, Comte, and Spencer quoted in some volume or journal as members of the same school, and to hear it asserted by writers of repute that the English school identifies physiology with psychology. So true is it that few in Italy, even among the learned, have been able to free themselves from all dogmatic prejudice and to see that the experimental study of subjective phenomena may have a rigorous scientific form independently of any definite solution of the problem of being.

Nevertheless a few recent publications of the Positive School in Italy deserve to be noticed. One of these is Niccola Marselli's *Scienza della Storia*, intended by the author to be the introduction to a work on the Philosophy of History not yet published, and containing an exposition and acute examination of the doctrines held on that subject: Marselli is a follower both of Hegel and Comte. Another is Ardigò's *La Psicologia come scienza positiva* (1871), the first attempt in Italy to give a definite shape to the principles and consequences of Positivism. Starting from the doctrines of the English School of psychology, taken in conjunction with the recent researches of Helmholtz and Fechner, Ardigò aims to rise above both Materialism and Spiritualism to the conception of a "psychophysical reality". His work reveals a mind of speculative power and aptitude for subjective analysis.

In our prosecution of psychological inquiry two facts have to be noted as promising well for the future of our philosophical studies. The one is the appearance of writings, mostly by young men, in which psychological observation is subjected to a division of labour and limited to the rigorous analysis of single phenomena or single groups of phenomena. Of such writings one of the most noteworthy is that by Dr. Paolo Riccardi, entitled *Saggio di studii e di osservazioni intorno all' attenzione nell' uomo e negli animali* (Modena, 1877). The other and still more significant fact is the exhibition by philosophers and men of science of a disposition to find in Psychology and Anthropology a common field of inquiry and study, which cannot fail to bear fruit. For on the one hand we have the recognition of the necessity of never separating the study of psychical from that of physiological, ethnical, and historical facts; and on the other, we have the avowal of the value of subjective observation together with the application of the strict

rules of the inductive method. It is some years since the celebrated Accademia dei Lincei of Rome, at the suggestion of its president Quintino Sella, instituted a new section for the moral, historical and philological sciences; and philosophy is now represented in it by Mamiani, Ferri, and Berti. Then again, the Italian Society of Anthropology and Ethnology, which meets at Florence, at one of its latest sittings changed its title to that of the Society of Anthropology and Comparative Psychology, intending thereby to mark its desire henceforward to add the culture of Philosophy to its previously restricted field of external and physiological inquiry. This change, it may be noted, was effected at the instance of Prof. Mantegazza, President of the Society, a distinguished physiologist and writer of works on hygiene, and of Prof. A. Herzen, well known by his *Analisi fisiologica del libero arbitrio.*

XI. In conclusion I would remark that, while there is thus a certain amount of activity in philosophical studies, there is as yet in Italy no true and proper speculative movement. The facts here brought forward will, I venture to think, have made it apparent that for twenty years and more the conditions surrounding our thought have been little in its favour, and have tended to check rather than promote its vigour. Looked at from any point whatsoever, the doctrines of Galluppi, Rosmini, and Gioberti have been the only product of speculation which Italy of itself has yielded during this century; and it was only so long as they were the expression of a great moral and political crisis, and responded to a living national want, that they were able to hold sway over the realm of thought. After 1850, overtaken by the spirit of the new times, they found themselves confronted by the Critical Scepticism and the Hegelianism which then began to make head in our midst. The division which thus sprang up was an irreconcilable one, and proved fatal to our thought by wasting its energies in barren contentions. German speculation had passed by a slow and gradual evolution from Leibnitz and Wolff through the criticism of Kant and the systems of Fichte and Schelling to Hegel; but not till the close of its splendid course did this great idealistic movement in its final outcome cross the Alps. Introduced among us it found our minds, by long habituation to theological dogmatism, little, if at all, trained to severe criticism and rigorous analysis, and disposed to make philosophy a question rather of nationality than of science. Between the "ideal intuition" of Rosmini and Gioberti and the "idea" of Hegel there was no middle term possible; hence there was no possibility of a serious and fruitful discussion between the followers of the two schools, nor any common ground

of agreement or of study. The one maintained an exclusively Italian tradition; the other repeated foreign doctrines. The attempts which both made to restore life and movement to Italian thought, without abandoning tradition, and to naturalise the philosophy of Hegel among us, have been attended, as yet at least, with no general or lasting results. And this, either because our minds were already exhausted, surfeited or distracted, or because we altogether lacked that spirit of application and discipline, which has contributed so much to the progress of science in Germany.

What we really stand in need of is the thorough scientific preparation that comes of patient observation, pyschological analysis, and a loyal and willing acceptance of whatever conclusions the strict application of scientific method may yield; and, fortunately, the signs are not wanting that such a process of preparation is at last making way in our midst. This is attested by the increasing interest displayed in psychological research, and by the attention bestowed on the History of Philosophy, ancient and modern, as shown by the recent publication of various valuable translations of ancient philosophers, and by the production of numerous special historical works and monographs. Of the German philosophers Kant alone can be said to supply a key to the history of modern philosophy, and as in Germany so with us he is now the chief object of study. Side by side too with the increasing knowledge of foreign languages grows our capacity for assimilating the ideas which they embody; while the habit of free thought is becoming confirmed, in proportion as the impulse to the study of the great philosophical, religious and social problems, that formerly came entirely from without, is now more and more begotten of the activity and growing energy of our own national life.

G. Barzellotti.

VI.—CRITICAL NOTICES.

On the Theory of Logic: An Essay. By Carveth Read. London: Kegan Paul, 1878.

I can here discuss only a few of the points raised by Mr. Read in his very thoughtful and suggestive essay.

The general view which he takes of the subject is that which may be called the objective or matter-of-fact view. Of this view Mill is the best known exponent in England; for although, as Mr. Read very fairly objects, he departs from this standing-point in his definition of the science, he preserves it with great consistency throughout nearly all the discussions in his volumes. It is not of course implied by Mr. Read that this subject-matter of Logic lies, so to say, outside of the human faculties, or can ever be anything but relative to those faculties. It is merely the position and mode of treatment appropriate to the science which is here discussed. "We may call it a postulate of the Abstract and Objective Sciences, that the subjective element may be neglected: we write, *Such is the course of Nature;* not, *Thus it appears to us.*" With this I find myself in entire accordance. At the same time, it seems to me as if this objective view was pushed almost too far; as if the author were attempting, partly in expression, partly in his mode of treatment, to lay aside more completely than is possible, the human or relative element in a system of Logic. Thus he always seems to regard the 'Term' as being a phenomenon itself, instead of being our representative merely, whether in thought or in language, of the phenomena. Thus he says: "How feelings are terms hardly needs pointing out"; and again: "As the likeness and unlikeness of terms in general is the fact which gives existence to classes, so the likeness and unlikeness of compound terms gives rise to those classes which are based on many attributes"; also: "A class consists of terms united by (1) likeness among themselves, (2) unlikeness to others"; whilst his 'Table of Terms' corresponds in consequence broadly with what Mill offers as a catalogue *raisonné* of existences in general, in substitution for the Categories. This is perhaps merely a matter of language, but it is surely an innovation, and one which leads to a redundancy in our objective nomenclature and a deficiency in our subjective (for what technical logical equivalent have we then left for the old 'term,' or 'name,' as it is more loosely called?). Moreover such a usage seems distinctly liable to lead to confusion when we have to talk of *essences*, and some slight trace of such a confusion I cannot but think is perceptible in this essay. Where are the properties of the essence to be sought—in the phenomena themselves or in our names for them? In the former, no doubt; but what Mr. Read does not seem to me to bring out clearly enough, is how largely the particular selection of them is our own; relative that is, not to human faculties in general, but to the particular needs and circumstances of the people who use the name. Some such expression therefore as 'the connotation of a class name' or of a 'term,' in its

common sense, is, I think, much preferable, as better serving to fix and call attention to this fact.

With every wish to make our treatment and point of view as objective as possible, it seems to me that there are a variety of points in which relativeness is practically forced upon us. For instance, the group of attributes which make up the connotation of a general term are decided by convention, tacit or avowed; they are those which are 'generally accepted' as distinctive and determining. But this convention, of course, lets in considerations of time and circumstance. That accession of new information would affect our decision about the connotation is always admitted, for the newly discovered attributes may force their importance and number upon the attention. But there is an even more important cause of change of convention than this, though it is often overlooked. A change in our point of view may considerably alter the order of importance of the attributes. What, for instance, is the definition of an ellipse, that is, the connotation of that term? To an ancient it was regarded as the curve obtainable by a plane section of a cone. It was one of the conic sections. But this is not the modern meaning; so far from it, that the fact of the ellipse being so obtainable only comes out, later in our study, as a remote corollary by mathematical deduction. It would now probably be defined as 'a plane closed curve of the second order'; for our whole way of regarding geometry has been affected by the introduction of Cartesian co-ordinates. What may be the next similar change in our point of view and consequent definition must be left to advanced geometricians to determine. The same change of view may be detected in the classifications of biology. What we may term the 'chasm of separation' theory of Natural Kinds, so familiar to readers of Mill, is being very generally abandoned. We do not now seek for that indefinite number of attributes which are to distinguish class from class; we do not even try to arrange and group our natural classes in accordance with their possession of the greatest number of important attributes. At least their importance is not one which would strike any ordinary eye.* What the classifier mostly aims at now, and what he is considered to have been unconsciously aiming at for some previous time, is to arrange the classes in accordance with their actual affinity by relationship and origin, genealogically that is. This point of view, depending on the theory of Evolution, *may* be the final one, but no one would yet venture to assert this positively. We are therefore to some extent in a difficulty when asked to say what is the essence, meaning, or connotation of any general term. We cannot say that it comprises *all* the attributes possessed in common by the objects in the corresponding class, for these may be infinitely numerous; moreover we should thus be losing the very useful distinction between real and verbal propositions. Nor, again, can we seek it in the

* See this very clearly brought out in Mr. A. R. Wallace's *Tropical Nature*, where he shows that in many cases some of the *least* obvious and striking, and, in any common sense of the word, important, attributes are the most valuable for the purposes of the scientific classifier.

attributes 'universally understood' by the term, for there is no such general consensus. We can really only seek it in the attributes generally assigned by those who are competently informed upon the subject. Within these limits of time and place there doubtless is some extent of agreement. This may not sound a very philosophic explanation, but it is best to avow it as the most tenable which is open to us.

Another expression which raises somewhat similar difficulties is that of 'Compatibility'. As Mr. Read says: "Relations of classes that *may* coincide are compatible". "Relations that *cannot* coincide are incompatible." I have no wish to quarrel with these terms, or abolish them from Logic: in fact we could not well get on without them. But they cannot be properly explained without taking into account not merely the objective attributes of the phenomena but also our own recognition and appreciation of these attributes. Looked at objectively, relations that 'cannot coincide' are simply those that never *do* coincide. There is no further meaning in the impossibility, and it is therefore adequately expressed by an ordinary universal negative. But what are, in themselves, relations that '*may* coincide'? As Bishop Butler says, things are what they are; any two relations either do or do not, wholly or partially, coincide, and could therefore be expressible by one or other of the A, E, I, O propositions. Any use therefore of the word 'may' is an introduction into the question of human ignorance about these relations, and a departure so far from strict objectivity.

Mr. Read has not indeed overlooked these considerations. He says (p. 157):—"We must distinguish three conditions of a phenomenon: (1) As it really is; (2) As we know it; (3) As our knowledge of it is expressed". The first of these means of course as the thing is phenomenally, not as it is *per se;* it means, that is, the knowledge which creatures with our faculties might eventually hope to attain to about it. But the second needs, I think, some explanation; 'as we know it' may mean anything or nothing, according to the persons referred to. The distinction here, as just remarked, is not the absolute one between the phenomenal and the noümenal, but the very relative one between the better and the worse known phenomenal. We ought therefore, I think, to have it clearly pointed out that the purely objective view has been here set aside, and that some convention has to be admitted as to the quantity of knowledge which may be postulated in reference to the phenomena, just as was found to be the case in reference to the definition of any term.

Mr. Read's discussions upon the subject of Causation seem to me very sound and useful, and to mark all that advance upon the older views which one would expect in a thoughtful student of the principles of modern physical science. Mill's view, as we understand him to say, is essentially the popular view; though refined, generalised, and rendered as rigidly and scientifically accurate as it admits of being. But it implies something *discontinuous;* the cause and the effect are events, that is, are fragments of experience broken off and regarded as

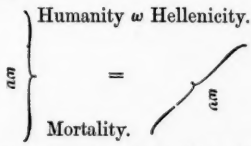
something separate and distinct each from the other. We have not sufficiently prominently set before us that absolute continuity of development which now finds expression in the doctrine of the Conservation of Energy. For ordinary purposes the ordinary view is necessary. It is only in terms so expressed that we can put and answer the question, What is the cause of such and such an occurrence? *i.e.*, How can it be brought about or avoided? And the well-known 'Four Methods' represent this view, carefully guarded, and advanced to the furthest point to which it is capable of being pushed. But when we proceed to subject it to close scientific scrutiny, we find that it is far from being capable of bearing the whole weight which it is attempted to put upon it. To mention no other instances, we should say that such puzzles as whether the effect can continue to persist after the cause has ceased, and whether an interval (however small) must exist between the cause and effect, have no other origin than this. They arise out of the attempt to combine a definition of cause, grounded on popular usage and limited by popular needs, with the rigid analysis and minute accuracy claimed by abstract scientific principles.

On the same grounds Mr. Read sees his way to getting rid of a distinction which must have before now seemed groundless to close thinkers, that, namely, of Plurality of Causes, or, as he terms it, Vicariousness of Causes. From the practical point of view the recognition of this vicariousness is abundantly useful, and indeed necessary. A man is found dead: what is the cause of his death? Was it accident, violence, suicide, or what? In this sense of the term many causes are possible. But, as soon as any one who is imbued with the conception of an orderly continuous evolution of phenomena comes to scrutinise these terms, he fails to see in 'cause' more than what goes before, and in 'effect' more than what comes after; and mere sequence in time can produce no such essential distinction as to admit of Plurality of Causes and exclude Plurality of Effects. Insist on taking account of every antecedent and of every consequent, and either term of the pair will necessarily imply the other. No one cause could venture to take the place of any other cause in hopes of producing the same effect; but every difference of antecedent must imply a difference of consequent, and *vice versâ*.

The part of Mr. Read's essay which is most original is that in which he discusses the nature of syllogistic reasoning, but the treatment seems to me too brief to do full justice to his views. Working mainly on the lines of Mr. H. Spencer, he differs from him on one important point, *viz*, the number of terms employed in the syllogism. The following extract (p. 240) contains, I think, the gist of his reasoning:—

> "To take an example: how many terms has this syllogism?
>
> Men are mortal:
> Greeks are men:
> Greeks are mortal.
>
> According to the old view, there are three terms: Greeks, Men, Mortals; or in comprehension, Mortality, Humanity, Hellenicity: and either way the three terms slide one into the other, as one shuts up a telescope.

According to Mill's Axiom, the correlation might be symbolised thus [in Mr. Read's symbols *]—



This, however, does not represent a relationship of classes at all; but only the concomitance of certain three qualities in the members of one class, namely, Greeks. For Hellenicity is not concomitant with all Humanity, nor Humanity with all Mortality. The evidence thus adduced for the mortality of Greeks is, the mortality of Greeks and no more: but much more is intended when it is argued that Greeks are mortal, because all men are. To rely on Mill's Axiom is to lose all that evidence of the mortality of Greeks which is derived from the mortality of the rest of mankind.

So far then I agree with Mr. Spencer that Mill's view is insufficient: . . . .

As I have said, the treatment here seems far too brief to do itself justice; at least, after perusing the passage a great many times, I have failed to understand it. In the first place, the words, "this, however, does not represent a relationship of classes at all," would seem to imply that Mill regarded syllogism, in accordance with the old view, as being primarily a matter of reference of classes to one another. But this can scarcely be meant, for Mill's view that propositions are nearly always to be interpreted (especially as regards their predicates) in connotation rather than in denotation, and his consequent rejection of Aristotle's *Dictum*, are too well-known for this to be possible. Then, again, with regard to the statement that "the evidence thus adduced for the mortality of Greeks is, the mortality of Greeks and nothing more". Let us take a still narrower case, that, namely, of an individual instead of a class. When we thus infer the mortality of Socrates instead of that of Greeks generally, is it meant that "the evidence thus adduced for the mortality of Socrates is, the mortality of Socrates and nothing more,"—Socrates, say, being still alive? If so, Mr. Read would, we may apprehend, naturally have chosen such an example, for it would have raised a far stronger objection, amounting in fact to a reduction to absurdity. But what else it can mean I do not see.

Mr. Read's main reason is presumably given in his remark that "the differential nature of Greeks is here omitted; wherein perhaps there may lurk something incompatible with mortality". True, there *may;* this is a contingency which can never be entirely obviated when, as here, we are supposed to be applying the syllogism to a new and unobserved case, or at least to be giving such an exposition of it as will suffice to cover new cases. No induction can be absolutely certain. Mr. Read seems to be omitting from consideration the fact that in the wide group denoted by 'men' we have already taken account of a multitude of precisely similar 'differential natures' among other

* ω is the sign of co-existence, *v* of succession.

nations,—Romans, various kinds of barbarians, and so on. If there were any reason to suppose that Hellenicity is specially antagonistic to mortality, it would show that our induction was being extended to a hazardous case, no doubt; but this does not appear to be a fair general ground of objection to the theory. And there seems another flaw in this objection. When Mr. Read speaks thus of Hellenicity,—the differential nature of Greeks,—is he not presupposing more knowledge than we have a right to expect? What, in fact, is Hellenicity? and what is the convention about the number of attributes to be included in this term? When we speak of Humanity and Mortality, all is clear enough; the previous inductions which decided that man is mortal may be supposed to have settled and defined these terms accurately already. But then a new man, a Greek, comes before us: can we fairly assume that we are already so familiar with him and his fellow-countrymen as to know distinctly what is meant by Hellenicity? The old class-theory of the syllogism would not demand this: Greeks, in respect of their denotation, might be known possibly by some casual attribute easy of observation; but when we speak of Hellenicity we surely mean to refer to the essential attributes of the term, and this, as already remarked, is a matter demanding a very definite convention and agreement.

It will be best to take a new example, both to get rid of the inveterate associations connected with man and his mortality, and to see how the newly observed case looks when it is presented to us without being already ticketed with a familiar name. Suppose, then, that we have arrived at the conclusion that all cruciferous plants are wholesome, or at least harmless. A shipwrecked crew on some desert island light upon a species of the cruciferæ, and infer that they may proceed to eat it. Now what corresponds to 'Hellenicity' here is the group of determining characteristics of this new species. But what do these sailors know of these characteristics? It would be an ill thing for them if they had to wait for such information before feeling sure of their inference. All that they observe is Crucifericity, if one may so call it (with which we suppose them already familiar), *plus* a multitude of other attributes, some of them accidental to the individual, others common to, and characteristic of, its species. But they have no means of distinguishing between the accidental and the essential, and therefore no power of taking account of any such bundle of attributes as would correspond to the Hellenicity of the last example.

Mill's explanation of such an example is, I think, plain, and we can easily see where he gets his three terms of the syllogism. We have observed that the attributes of the cruciferæ are accompanied by wholesomeness:—there we have two terms. The new plant or plants yield the third term; the exact extension of which is perfectly immaterial. All that we care to observe is the presence of the cruciferous attributes: the additional presence of other attributes as well, which serve to make a third term of it, does not really concern us. Equally easy is it to see where Mr. Spencer finds his *four* terms. The first two are the same as above. The third term becomes a third, not merely on account of

the non-cruciferous additional attributes, but also because (as he maintains) these cruciferous attributes themselves are not the *same* as those which yield the induction expressed in the conjunction of the first two terms, but merely *like* them. The fourth term is the 'wholesomeness' of the new plants; which, like their cruciferous attributes, merely *resembles* the former observed wholesomeness.

But how does Mr. Read get his *five* terms of the syllogism? Four I can see clearly enough; but the fifth, which is yielded by distinguishing, in the former familiar example, between Hellenicity and Hellenic Humanity, seems to me to rest upon an illusion caused by our long familiarity with two distinct names. When we come to deal with a new example we have not even the names whereby to express the corresponding distinction, and it is difficult to see how more than four terms can be conceived as necessary.

Mr. Read's formal statement of his principle, or 'Rule of Quinqueterminal Correlation,' as he designates it, is as follows:—"A Term which coexists with a second Term—that second Term and a third being severally the same as a fourth and a fifth Term, which are related to one another by Co-existence or Succession,—is related to the third Term, as the fourth to the fifth, and as the second to the third". It is not easy to apply this rule to the example I have proposed, from want of the requisite names, so we must revert to the old example. The five terms here are respectively, Hellenicity, Hellenic Humanity, Mortality of Hellenic Humanity, Non-Hellenic Humanity, Mortality of Non-Hellenic Humanity. Of these, the fourth and fifth correspond to the first pair, or relation, of Mr. Spencer; the first and second (taken together), and the third, correspond to his second pair;—these two pairs, or relations, on Mr. Spencer's scheme, being recognised as 'like' one another. It is just this subdivision by Mr. Read of the first member of the second pair into two, Hellenicity and Hellenic Humanity, which seems to me unnecessary, and in most cases unattainable, at least with any accuracy. When we observe our new case, I do not see why we need do more than recognise in it the same (or the like) attributes as we had already perceived in former cases. Its additional or specific attributes do not concern us; if we are drawing the conclusion about an individual we do not want them, and if about the whole of a new species, the determining characteristics of that species may be unknown as yet.

One other novelty in Mr. Read's system is his symbolic expression of the various kinds of relation (such as similarity, coexistence, &c.) which are required to be expressed in that extended view of the reasoning process taken by Mr. Spencer. These have been introduced into the extract quoted above, and were set out by Mr. Read himself in MIND VII. It is hard for those whose business requires them to keep in mind a number of distinct sets of symbols, Hamilton's, Boole's, De Morgan's, Jevons's, and so on, to regard entirely without prejudice the introduction of a new set. But laying this prejudice aside, Mr. Read's seem to me decidedly suitable and good.

J. VENN.

Les trois premières années de l'Enfant. Par BERNARD PEREZ. Paris: Germer Baillière et Cie, 1878. Pp. xiv. and 294.

M. Bernard Perez belongs to the unofficial but already important school of French thinkers who welcome and appreciate to the full Mr. Darwin's work. They are paying it the best kind of tribute by carrying out its principles in researches of their own, and M. Perez has here given us an excellent study of human development on what one may call Darwinian lines. It is a series of careful and well-considered observations on the natural history of the children of civilised European parents during the first three years of life. We may assume that all the subjects observed were the children of persons of a certain standing and culture; but whatever hereditary differences may be due to ancestral education and refinement probably do not come out until a much later time, or at all events may be neglected in the present rough state of our knowledge.

A study of this kind may be arranged chronologically or analytically; it may follow the history of the child from birth onwards, which seems the natural way when only one individual is dealt with, or it may be distributed according to the several functions and activities whose development is observed. M. Perez, having it would seem a rather extensive acquaintance with small children, has adopted the latter method, which enables many distinct observations to be conveniently grouped. This entails indeed a certain amount of repetition, from which M. Perez has very wisely not shrunk on the necessary occasions. At the same time he proceeds from the simpler to the more complex functions, thus following the order of growth as far as his method allows.

He begins with the first evidences of sensibility to the influence of the outer world—the earliest pleasures and pains of taste, touch, heat and cold, sight, hearing, and smelling. He goes on to the appearance of the passions in a rudimentary form. Fear, jealousy, anger, are all noted at two months old and even less. St. Augustine was much shocked by the sight of two children fighting for the breast at a very early age, and found in it a proof of original sin. The observation is perhaps the earliest on record, except the case of Jacob and Esau, but does not deserve much credit from a scientific point of view. M. Perez does not notice it, possibly for that reason. Curiosity, the association of pleasant or painful sentiments with particular objects, and the dawn of the social feelings, are then passed in review. As to animals, M. Perez thinks they are to a child's mind mere playthings, more amusing because they afford more variety. Probably this is so for some time: but at a later stage the dog or cat is treated very much like a person. I have seen a child of two years old gravely attempt to make the cat look at pictures, offer its doll to be kissed, and the like. But (in confirmation of M. Perez) a few months earlier one of the same child's ambitions in life was to stand on the cat's tail, and she obviously could not see why it should object. As to human sympathies, children are unfeeling, "par défaut d'expérience et faiblesse de jugement": they can be much affected by real or supposed pains of which they have

some experience in their own persons. A child that has just cried at being dipped in the sea will cry again when the nurse dips herself for her own pleasure; and M. Perez gives a similar instance from a friend's notes.

The next topic is "motricité," the development of motions both reflex and voluntary. Here Mr. Darwin's materials are freely used, and M. Perez adds some notes of his own on the early biography of two kittens. He compares their progress with the much later and more conscious advances of an infant learning to walk. As to voluntary activity in general, M. Perez' position is that "la volonté est toujours déterminée par un sentiment, qu'il soit ou non clairement aperçu par la conscience". The practical conclusion, justly insisted on as of great importance, is that the will must be educated through the emotions, and education of the emotions can hardly begin too soon. The growth of self-consciousness, attention (which English nurses call "taking notice"), and memory are then traced; and chapters which are both instructive and amusing are given to association, the formation of general ideas, and comparison. M. Perez treats comparison as an outgrowth of abstraction; I should myself be disposed to think that abstraction involves the perception of resemblance, the perception of difference being an ultimate element in consciousness itself. But this belongs to general psychology, if not to metaphysics. And besides M. Perez is dealing with the comparison of feelings already grouped into concepts. A droll example is given from the bewilderment of a child of eight months, who was unable for several minutes to make out that two grey cats of about the same size were not one and the same. The first effect on its mind must have been something like Kehama diving into the realm of Yama by eight gates at once.

Under the head of imagination we have a rather miscellaneous list of notes, including the beginnings of dramatic play. M. Perez notices a curious point, which must be familiar to even casual observers, and which many of us may remember in our own persons; I mean the fixed obstinacy of children in requiring to have a song or story in the exact form in which they first heard it. It is a letter-worship of the most rigorous kind, and the habit endures almost into years of discretion; in some cases probably longer. My own recollection informs me distinctly enough of a little boy who, long after he could read, assumed everything he saw in print to be absolute truth. Is not this rather a poverty of imagination than a positive manifestation of it? There is the power of conceiving the story or statement and making it a mental possession, of retaining what is put in. But there is also the incapacity for entertaining anything different; whatever is first put in occupies as it were the whole field, and maintains a possessory title, however acquired, against all new comers.

On the point of generalisation, M. Perez differs from the opinion of Max Müller and Taine, that no general ideas can be formed without words; he accepts M. Taine's instances, but interprets them otherwise, holding that "le mot progresse comme l'idée et par l'idée". In the chapter on judgment we have further excerpts from the biography of

the two kittens already mentioned, and some very curious facts from M. Houzeau on the powers of certain animals to count. There is distinct evidence that mules can count up to five. Mankind are long in learning this art. It is said that European children cannot count ten with intelligence under the age of 6 or 7 years. A little friend of M. Perez, two years and a half old, had no notion of what was meant by three days. It had to be paraphrased to him as "demain, demain, et encore demain".

We pass on to the more complex feats of reasoning and language. M. Perez has some excellent remarks on the folly of repressing the mental growth of children by too much supervision; he counsels a "vigilant and benevolent neutrality, not occasional despotic interference". On the formation of language, M. Taine's notes, which have already been before the readers of the MIND, are in part reproduced. Attention is called to the monosyllabic character of infantile language, which I have myself found very conspicuous. Occasion is found for another valuable practical remark, that early facility in talking is by no means a safe measure of real intellectual progress. "Plus un enfant est intelligent, moins il se paie de mots, plus il faut que les mots signifient quelque chose pour qu'il les apprenne, et c'est pourquoi il n'en apprend qu'à mesure qu'il se fait des idées nettes des objets." One of the greatest dangers in early education is the filling of children's ears and mouth with words they do not (or even cannot by any possibility) understand. The relatively very late place of "l'idée du moi"—*I-making*, as the Indian philosophers called it—in the growth of the individual mind is carefully brought out. M. Perez thinks that even when "I" does come to be used, it is at first only as a proper name; a synonym for the "Paul" or "Mary" with which the child formerly spoke of itself in the third person. And indeed it is pretty obvious that, being unique as a generic name both in meaning and in usage, the term "I" cannot be grasped in its full import without a considerable intellectual effort. The general sense of personality, the feeling of an individual existence to be maintained and the self-regarding desires which flow from it, are of course much earlier. Has any language yet been found in which the personal pronouns are defective, or show any clear traces of their date of formation? The point seems worth attention.

The last chapter deals with the rudiments of the moral sense, and lands us on the threshold of adult psychology. Some anecdotes are given which show the uses of a cat—especially a cat "qui n'est pas endurante"—in the moral education of a masterful child. In the case of an only child the cat is indeed the only power that can make itself respected on a footing of independent and equal rights. Probably a dog would not do so well; dogs are too long-suffering.

M. Perez' book is very pleasant reading, and neither its interest nor its uses ought to be confined to students of psychology. I hope that it may find its way to the hands of many parents both in France and elsewhere.

F. POLLOCK.

SEBASTIANO TURBIGLIO: *Le Antitese tra il Medioeva e l'Età Moderna nella Storia della Filosofia in ispecie nella dottrina morale di Malebranche.* Roma, 1877.

The author of this work is professor of the history of philosophy in the University of Rome. He has devoted himself with great zeal to the study of the history of modern philosophy, and during the last twelve years has published several works which, although small in size, are weighty with the results of intense and subtle research. His *History of the doctrine of Descartes and of its logical development in the chief representatives of the Cartesian School*, his *Experimental Philosophy of John Locke reconstructed à priori*, and *Spinoza and the transformations of his thought*, will be acknowledged to be remarkably able treatises even by critics who find their value lessened by the presence and operation of certain principles which the author has, unfortunately perhaps, adopted as essential to true historical criticism.

The work now to be noticed is dedicated to Prof. Zeller of Berlin, whom Signor Turbiglio regards as an illustrious example of the highest type of the historian of philosophy, and whose banner he professes to have chosen as his own, while indicating that he differs from him on some secondary points. An attentive examination of the work itself will probably convince most persons that he has underestimated the differences between his views and those of Prof. Zeller as to the method and principles of the history of philosophy; these differences being more numerous than he himself seems to suspect, while some of them are certainly not secondary but fundamental. There follows a long preface, and obviously the work has been written rather for the sake of the preface than the preface for the sake of the work. Here the author explains the principles on which he has proceeded in his former publications, and endeavours to vindicate and establish them. He hopes thus to show the futility of the criticisms directed against his treatise on Spinoza by Ulrici in the *Zeitschrift für Philosophie*, by a writer in the *Westminster Review*, by M. Espinas in the *Revue Philosophique*, and by the author of the notice in MIND V., who may as well confess himself, since the notice happened to be unsigned, to be the same person as the present reviewer. But, however it may be with the others, the writer of the notice in MIND has certainly not found in Signor Turbiglio's lucid exposition any reason to modify his judgment. He can assent to few of the so-called principles which are there presented; from most of them he decidedly dissents. For example, he cannot admit that the historian of philosophy ought to abstain, as Signor Turbiglio thinks, from inquiries regarding the truth and value of the systems which he analyses and reconstructs; that historical criticism is independent and exclusive of scientific criticism. Signor Turbiglio perceives that the history of no science could be written on this principle, but he believes that the objects of philosophy are merely general ideas formed by the synthetic power of the mind, while the sciences are conversant with particular facts and the real relations which unite them. Is this, however, not merely to urge in support of an error another, or rather, by implication, a whole series of other

errors? That the objects of philosophy are general mental conceptions, —that the objects of the sciences are particular facts,—that the history of philosophy is essentially different from the history of a science,— that philosophy ought to be regarded by its historians otherwise than it has been regarded by all men who seriously philosophised, namely, as the search for ultimate truth,—and that history may have its standard in itself apart from the reality and value of that of which it is the history,—are all propositions involved, and even more or less explicitly avowed, in the argument of our author, while they seem to his reviewer to be subjective and unprovable dogmata which it is necessary to repudiate in the interests of genuine historical research. Again, Signor Turbiglio directly combats the view of Zeller that the free-will or personality of philosophers must be treated by the historian of philosophy as among the causes of the development of speculative thought. He holds that liberty must be eliminated, and that the history must be regarded as a necessary process. But his reasons for this seem unsatisfactory. Were it even true, as he supposes, that the history would be more easily and thoroughly explicable if personal forces did not require to be taken into account, it by no means follows that the convenience of the historian has actually been consulted, while the supposition is itself a most questionable one. The argument from the logical character of the development of Cartesianism in its chief representatives shows that the history of philosophy is a rational process, but not that it is an involuntary one. The historian has no right to assume either liberty or necessity as a principle. Perhaps he has no need to infer either as a consequence.

The most distinctive of Signor Turbiglio's principles is the difference between the apparent and the real in philosophical systems. It has gradually attained its present dominant influence over his mind. In his work on Cartesianism it was present only as the idea that there was an impersonal and necessary evolution of thought from representative to representative of the school. In that on Locke it appeared as the thesis that Locke willed one thing and performed another,— believed that he had built up a system by patient induction when that system was really the result of a continuous deduction. In the treatise on Spinoza it came still more clearly to light in the doctrine of a real and an apparent Spinoza. In the work before us it is formulated and defended as a fundamental principle of the highest importance. Has the course of Signor Turbiglio been in this respect a growth in truth or error? I confess that I think it to have been the latter. He seeks to establish his opinion by showing that the distinction between appearance and reality is recognised in all the sciences. But he overlooks two weighty considerations. First, he fails to observe that even in the sciences the distinction is neither essential nor definite, arising entirely from the relativity of knowledge. Truth to a dull and feeble sense is not truth to one which is acute and strong; truth to sense is not truth to intellect; every cognition when transcended and replaced by one more comprehensive and adequate is supposed to have been reduced from the rank of an expression of reality to that of

an expression of appearance. It will be observed, however, that here there need not be merely two, but, may be, an infinite number of stages, and that the lowest stage of so-called appearance may be as real as that highest stage which is supposed to be reality merely because it has not yet been transcended. Again, he fails to recognise that even if the distinction for which he contends could be traced in the *objects* of astronomy, chemistry, biology, &c., it would not follow that it could be traced in consciously and carefully constructed *systems* either of science or of philosophy. Is there a real and an apparent Newton in the *Principia*, or a real and an apparent Laplace in the *Mécanique celeste?* If not, how is there a real and an apparent Locke in the *Essay concerning Human Understanding*, or a real and an apparent Spinoza in the *Ethica?* The proper comparison is obviously between philosophy and science as existing in a mind or expounded in a book, not between philosophy and the objects of science. The transition from things to thoughts involved in Signor Turbiglio's argument renders it irrelevant and inconclusive. I do not admit, then, that two philosophies can be evolved out of one. When Signor Turbiglio attempts to do this, as in the case of Spinoza, it is by a rearrangement or reconstruction of the philosopher's thoughts, which seems to me necessarily to alter their signification. No more was meant than this when I said that he had "arbitrarily, although most ingeniously, rearranged the thoughts of Spinoza, and given the words in which Spinoza expressed them a new meaning in their new connexion". No "*grave accusa*" or "*acerba censura*" was in the least implied, but merely dissent from a method or principle of retrospective reconstruction. Signor Turbiglio's critical honesty and conscientiousness are as manifest as his ability.

The rest of the treatise consists of three parts, the first treating of the genesis of modern philosophy, the second of the pantheistic idea in the modern age, and the third of the evolution of the moral idea in Malebranche. Several of the generalisations in them appear to have been derived from an inadequate survey of the relevant facts, but every chapter is so full of independent views and so richly suggestive that justice could be done to the book only by a long review, instead of a mere notice. The work is one to be cordially recommended. Its author is a man of genuine talent both as a thinker and a writer. All who are acquainted with what he has already done will rejoice to know that he has it in view to publish the results of his studies on the philosophy of the Renaissance.

R. Flint.

Die Axiome der Geometrie. Eine philosophische Untersuchung zur Riemann-Helmholtz'schen Raumtheorie. Von Dr. Benno Erdmann, Privatdocenten der Philosophie an der Universität zu Berlin. Leipzig: Voss, 1877.

This is a valuable monograph, intended to reconcile the diverse opinions touching the philosophical import of the new non-Euclidean geometry. According to Dr. Erdmann, the axioms of Euclid give

rise to questions concerning both their systematic connexion and their origin and meaning. Besides the axioms applicable to quantities of any sort, there are others stating properties of space. The chief difficulty was always felt about the eleventh axiom, which, involving the notion of parallels and the sum of the angles in a triangle, stood altogether apart, and could neither be dispensed with nor logically connected with any other fundamental dictum. At last, from the speculations of Lobatschewsky, Bolyai, and Gauss, it appeared that a consistent geometrical doctrine may be evolved from an hypothesis in contradiction with the said axiom; and soon after, the late Bernhard Riemann discussed space in general and showed that those contradictory systems, Euclidean and Imaginary Geometry, are the expressions of different kinds of space that we may in turn assume as existing. Continued chiefly by Beltrami and Helmholtz, these researches have finally led to a comprehensive theory that may be termed Pangeometry, and is discussed at length in Dr. Erdmann's second chapter (pp. 34-88). Although admitting that our presentation of space is an intuition *sui generis*, the author observes that we have in particular not only intuitions of lines, triangles, &c., but concepts of such as geometrical species, and that these may be treated not only as concepts of space but of quantity, so as to be determinable by algebraic formulas. Now in the same manner we may form a concept of our universal space as of a quantity: *viz.*, a continuous quantity, of which the elements are universally determined by three commensurable variables, and with a constant measure of curvature equal to zero. Generalising the number of variables into n, and omitting the amount of the curvature, we obtain a *summum genus* of spaces with a constant curvature, and hence, by replacing the number three, we come down to a concept that embraces our own space as well as spherical space with a positive, and pseudospherical space with a negative, measure of curvature. So Pangeometry branches out into different alternatives, of which Euclidean geometry is but one, and by the light of this discovery the traditional axioms may be reconstructed so as to determine the kind of space considered in our usual geometry, and provide the elements for its production. Restoring the intuitional character which we disregarded while treating of space merely as a sort of quantity, our common space is described as "a threefold extended complexity, congruent in itself and flat (endless)". All this would be perfectly clear, if we were only taught how to conceive a measure of curvature without recurring to intuition.

In a third chapter (pp. 89-135) the philosophical consequences of the new doctrine are discussed. Thinkers now all but universally admit that our spacial presentation cannot be the simple repetition of an arrangement of real things that affect our senses. On the other hand they will be ready to concede that it is dependent not only on a predisposition or capacity of our mind, but also on the nature of impressions that prompt the mind to form its presentations. From the fact of Pangeometry we learn that our mental predisposition in itself admits of more than one sort of spacial intuition, so that it

must needs be the impressions that determine the specifically Euclidean properties of our actual image of the world. So much for empirism as against nativism in psychology. Turning to the epistemological question, Dr. Erdmann shows that our presentations may be viewed either as dependent on or independent of the things represented; and, in another respect, either as faithful likenesses of things, or as reproductions only of their form (say, of quantitative relations of space, time, and law), or else, as mere indications of their presence, that vary together with the nature of things, while differing from them in nature altogether. Accordingly, "empirism" may be subdivided into *sensualism, formal empirism,* and *apriorism;* and, on the same principle, "rationalism" into the *doctrine of pre-established harmony, formal rationalism,* and *absolute rationalism* or *nativism.* It is true that few historical systems tally exactly with these distinctions. Most of them offer a compromise between two or more of the typical doctrines, which it will be well, for clearness' sake, to resolve into its constituents. So much we see already, that the modern geometry is incompatible with any kind of "rationalism". Choosing between the possible sorts of "empirism," Riemann and Helmholtz declare for its formal variety, whereas our author offers his reasons for adopting what he terms *apriorism,* though he grants that even sensualism, "the naïve assumption of the unscientific consciousness," is not repudiated by the new mathematics.

In the fourth chapter (pp. 136-174) Dr. Erdmann draws up his conclusions in the regular form of a philosophical theory of geometry. His readers will find that there are few philosophical treatises, especially in German, so skilfully arranged and neatly worded as this little book, to the merits of which it is impossible to do full justice in a brief notice like the present.* Of course, the author will not expect to have silenced all opponents. As such we may already point out A. Weissenborn in Avenarius's *Vierteljahrschrift* (II., 2 and 3), and Albrecht Krause in a separate publication.† On his own part, the present writer may be excused for briefly stating the cardinal doubts that remain with him unshaken even after both Dr. Erdmann's monograph and Prof. Helmholtz's second paper (in MIND X.).

To borrow the terminology just explained, the characteristic feature of Kant's space-theory appears to be not "rationalism" but "apriorism".‡ In the third section of his last article, Prof. Helm-

*It is hardly worth while to enumerate oversights. P. 51, *in fine,* the words *Nenner* and *Zähler* ought to change places; *cf.* p. 57. P. 90, l. 10, read: *der eine jener Fragen.* Of material difficulties I mention merely as an example the "rigorous definition" on p. 155: "A straight line is one of which every linear element has zero for its constant measure of curvature". Now, a measure of curvature, according to pp. 51 and 57, is conceived by means of radii, and how to conceive radii except as a kind of straight lines?

†*Kant und Helmholtz über den Ursprung und die Bedeutung der Raumanschauung und der geometrischen Axiome.* Lahr: Schauenburg, 1878.

‡See, *e.g.,* Kant's *Werke,* III., p. 154, Rosenkr: "All knowledge of

holtz himself shifts his position for a moment from "formal" to "aprioristic empirism". That sensual experience is a *conditio sine qua non* for the actual occurrence of spacial intuitions, is also a point of Kantian doctrine.* And Dr. Erdmann adopts Prof. Hemholtz's statement,† that Kant differs from the true nativists in this respect, that he only avers space-intuition to be a form of our receptivity, without assuming particular spacial intuitions as innate. Up to this point it would seem that we all four agree. Only, the new geometry (of which Kant had a presentiment as early as 1746, *Werke*, V., p. 27) appears to both our Berlin thinkers to open a prospect towards a more precise distribution of parts between mental constitution and outward influences, which I must persist in considering as wholly delusive. Supposing it could be proved, as they contend, that our mind taken by itself is equally open to the intuitions of all or several of the kinds of space defined by Pangeometry, then indeed it would follow that our actual beholding of a world in Euclidean space ought to depend on something in the impressions that codetermine our consciousness from without. But the difficulty is that the proof we require cannot really be given. First of all, in this order of investigations we have no right to appeal to physiological or psychophysical research, however admirably conducted, because this necessarily proceeds on the assumption of objective space, and the appeal is of no avail unless we could consider objective space as equivalent in some sense to absolutely real space,—which, as involving a begging of the question, we are not at liberty to do. Speaking critically, as we must do in this case, a space inhabited by an intelligent being cannot be shown to have any connexion with a space conceived in that being's mind. So the one legitimate way open to our speculators is to argue from the possibility of imagining other relations of space beside those of Euclid. Against such arguing I need not urge that this possibility is, even in the case of Prof. Helmholtz, but a very limited one. Even if fully admitting that the imaginative powers of highly cultivated men may be expanded so far as to embrace spherical, pseudospherical, and perhaps other spaces of three dimensions with the same ease as that to which we are all accustomed, we should be compelled to ask whether they owed that expansion to an emancipation from the narrowing influence of constant Euclidean experience, or rather to a more advanced development from the data of Euclidean experience itself. There is a vast difference between the notion of what our mind may be

things merely from pure intellect or pure reason is nothing but appearance, and truth is only in experience".

* *Werke*, II., p. 340, Rosenkr: "Space—considered before any things that determine (fill or limit) it, or rather, which give an empirical intuition in accordance with its form—is (under the name of absolute space) nothing but the naked *possibility* of outward phenomena. . . . The empirical intuition is not a compound from phenomena and space (or observation and empty intuition), . . . but both are combined in one and the same empirical intuition, as its matter and form respectively."

† Erdmann, p. 105; Helmholtz, *Handb. der physiol. Optik*, p. 441.

in itself capable to perform, and what it may be trained to achieve subject to the express condition of beginning with an experience that provides an Euclidean basis and no other. Anybody studying those modern mathematical theories—of which I nowise would disparage the technical importance—will perceive their continuous generation out of the old geometry. Indeed it is from Drs. Helmholtz and Erdmann themselves that we learn to understand them in that light. With the facts before us, why should we hold Pangeometry to exist by virtue of our mental nature in spite of habits acquired by impressions from without, rather than to be a logical outgrowth of Euclidean geometry, which latter we acknowledge as the joint produce of mind and impressions? It is true that in the latter case the old question returns, unsolved as before: How much in our experience is due to the nature of mind and to solicitations from the outside respectively? But it may be better for philosophy to recognise this present state of things than impatiently to accept from physical science a sort of *solvitur ambulando.*

J. P. N. Land.

VII.—REPORTS.

Consciousness under Chloroform.—Under this title Mr. Spencer has just added to the Appendix of Vol. I. of the *Principles of Psychology*, the following remarkable record of experience with his observations on it:—

A University graduate whose studies in Psychology and Philosophy have made him an observer able to see the meanings of his experiences, has furnished me with the following account of the feelings and ideas that arose in him during loss of consciousness and during return to consciousness. My correspondent, describing himself as extremely susceptible to female beauty, explains that "the girl" named in the course of the description was an unknown young lady in a railway carriage which brought him up to town to the dentist's. He says his system resisted the influence of chloroform to such a degree, that it took twenty minutes to produce insensibility: the result being that for a much longer time than usual he underwent partial hyperæsthesia instead of anæsthesia. After specifying some dreadful sensations which soon arose he goes on to say:—" . . . I began to be terrified to such a wonderful extent as I would never before have guessed possible. I made an involuntary effort to get out of the chair, and then—suddenly became aware that I was looking at nothing: while taken up by the confusion in my lungs, the outward things in the room had gone, and I was 'alone in the dark'. I felt a force on my arm (which did not strike me as the surgeon's 'hand,' but merely as an external restraint) keeping me down, and this was the last straw which made me give in, the last definite thing (smell, sound, sight or touch) I remembered outside my own body. Instantly I was seized and overwhelmed by the panic inside. I could feel every air-cell struggling spasmodically against an awful pressure. In their struggle they seemed to tear away from one another in all directions, and there was universal racking torture, while meantime the common foe, in the shape of this iron pressure, kept settling down with more and more irresistible might into every nook and crevice of the scene. My consciousness was now about this: I was not aware of anything but an isolated

scene of torture, pervaded by a hitherto unknown sense of terror (and by what I have since learnt is called 'the unity of consciousness': this never deserted the scene, even down to the very last inaudible heart-beat). Yet I call it a 'scene,' because I recognised some different parts of my body, and felt that the pain in one part was not the same as that in another. Meanwhile, along with the increased intensity of convulsion in my lungs, an element of noise had sprung up. A chaotic roaring ran through my brain, innumerable drums began to beat far inside my ear, till the confusion presently came to a monstrous thudding, every thud of which wounded me like a club falling repeatedly on the same spot. . . .

"From this stage my lungs ceased to occupy me, and I forget how the struggle finished. There was a sense of comparative relief that, at any rate, *one* force was victorious, and the distraction over; the strange large fright that had seized me so entirely when I felt myself ensnared into dark suffocation was now gone also, and there was only left the huge thudding at my ears, and the terribly impetuous stroke of my heart. The thudding gradually got less acutely painful, and less loud; I remember a recognition of satisfaction that one more fearful disturbance was gone. But, while the thunder in my ear was thus growing duller, all of a sudden my heart sprang out with a more vivid flash of sensation than any of those previous ones. The force of an express engine was straining there, and like a burning ball it leapt from side to side, faster and faster, hitting me with such superhuman earnestness that I felt each time as if the iron had entered my soul, and it was all over with me for ever. (Not that 'I' was now any more than this burning hot heart and the walled space in which it was making its strokes: the rest of 'me' had gone unobserved out of focus.) Every stroke produced exquisite pain on the flesh against which it beat glowing, and there was a radiation, as from a molten lump of metal between enclosures. Presently the unbearable heat got less, and there was nothing remaining except a pendulous movement, slackening speed, and not painful. Of nothing beyond was I conscious but this warm body vibrating: not a single other part of me was left, and there was not a single other movement of any sort to attract my attention. A fading sense of infinite leisure at last, in a dreamy inaudible air; then all was hushed out of notice.

" . . . There was the breaking of a silence that might have been going on for ever in the utterly dark air. An undisturbed empty quiet was everywhere, except that a stupid presence lay like a heavy intrusion *somewhere*, — a blotch on the calm. This blotch became more inharmonious, more distinctly leaden; it was a heavier pressure,—it is actually intruding further,—and before almost there was time to wonder feebly how disagreeable was this interruption of untroubled quiet, it had loomed out as something unspeakably cruel and woeful. For a bit there was nothing more than this profoundly cruel presence, and my recognition* of it. It seemed unutterably monstrous in its nature, and I felt it like some superhuman injustice; but so entire had been the still rest all round before its shadow troubled me, that I had no notion of making the faintest remonstrance. . . . It got worse. . . . Just as the cruelty and injustice became so unbearable that I hardly could take it in, suddenly it came out a massive, pulsating *pain*, and I was all over one tender wound, with this dense pain probing me to my deepest depths. I felt *one* sympathetic body of atoms, and at each probe of the pain every single atom was forced by a tremendous pressure into all the rest, while everyone of them was acutely tender, and shrank from the wound—only there was nowhere to shrink. A little before, I had merely

* If there were a noun belonging to the verb 'to be aware of' like 'recognition' to 'recognise,' it would be the one to use here.

felt the cruel element, in helpless passivity; now, a still more crushing probe came; for an instant it forced all my atoms into one solid steel-mass of intense agony—then, when things couldn't go much further, and all must be over, a sense of reaction emerged; there was a loosening, and I was urged into relief by uttering from my very depths, what seemed not so much (at first) a piteous remonstrance as a piteous 'expression' (like an imitation) of the pain: in fact, the sense of woe had got also *outside*, and I *heard* it, a very low, infinitely genuine, moan. . . . The next second there was a change: hitherto it had been pain *partout*—now there came a quick concentration, the pain all ran together (like quicksilver), and I suddenly was aware that it was (localised) *up on the right;* while simultaneously with this recognition of locality, a feeling of incipent *resistance* began to be in *other parts* (not that I felt them except just as *other* parts) of me from which the pain had receded. The pain itself was no less intense, rather more vivid, only I seemed to take it in a more *lively* manner: my uttering of a moan was no longer a mere faithful representation out into the air of what was inside me, but I had a slight sense of making an appeal for sympathy: to whom or to what I did not know, for there was no one or anything there. I was just going to utter a yet louder moan—as a fresh fearful imposition of force plunged into me—when, there in front of me, to the *left* of my pain, was that girl, with those lovely ankles, and the graceful Zingari brown stockings. . . . I felt, as distinctly as if some had told me aloud, that I would not make any cry, that it was not the thing.

"Now came an agonizing cold wrench, and two or three more successively, in such a hideously rough fashion, that the girl went, and everything was tortured out of me but the darkness and the gigantic racking swaying torture which was excruciating my right side. An iron force like a million-horsepower had hold of me, and I was being pulled upwards and out of where I was, while I myself seemed another million-horsepower which would *not* be pulled: the pain was something to be remembered. But up I came, the darkness got denser (I went so fast); it was vibrating, the dense agony vibrated faster; *I* was quivering, struggling, kicking out; everything was a convulsion of torture, my head seemed to come to the surface, a glimpse of light and air broke on the darkness, voices came through to me, and words; I recognised that a '*tooth*' was being slowly twisted out of my jaw, then I groaned imploringly, in true earthly style, as if this was *too much*, and I ought to be let alone now I was getting my 'head' out; then I swallowed in air, made an exertion with my 'chest' found my 'arms' were pressing something hard, grasped the 'chair' and pushed myself up out in bewildered light, just as the dentist threw away the second right molar from the upper jaw."

Concerning this account it may be remarked, on the one hand, that the higher consciousness seems not to have been wholly abolished; since there remained certain emotions and certain most general ideas of relation to objective agents. On the other hand it is to be doubted whether the partial consciousness which the narrator had during anæsthesia, is not, in the description, eked out in some measure by the ideas of his recovered consciousness carried back to them. Be this as it may, however, it is clear that certain components of consciousness disappeared and others became extremely vague, while a remainder continued tolerably distinct. And there is much significance in the relations among them:—1. There ceased earliest the sensations derived from the special senses; then the impression of force acting on the body from without; and, simultaneously, there ceased the consciousness of external space-relations. 2. There remained a vague, sense of relative position within the body; which, gradually fading, left at

last only a sense of those space-relations implied by consciousness of the heart's pulsations. 3. And this cluster of related sensations produced by the heart's action, finally constituted the only remaining distinct portion of the Ego. 4. In the returning consciousness we note first a sense of pressure *somewhere:* there was no consciousness of space-relations within the body. 5. The consciousness of this was not a cognition proper. In an accompanying letter my correspondent says of it: —"'Recognition' seems to imply installation in some previously-formed concept (talking in the Kantian way), and this is just what was *not* the case:" that is, consciousness was reduced to a state in which there was not that classing of states which constitutes thought. 6. The pain into which the pressure was transformed was similarly universal instead of local. 7. When the pain became localised its position in space was vague: it was "up on the right". 8. Concerning the apparition of "the girl," which, as my correspondent remarks, seems to have occurred somewhat out of the probable order, he says in a letter: —"I did not recognise her 'under any concept'—what I saw seemed to be almost unassisted intuition in the Kantian sense." 9. The localisation of the pain was at first the least possible—the consciousness was of that part *versus* all other parts unlocalised.

These experiences furnish remarkable verifications of certain doctrines set forth in the *Principles of Psychology.* This degradation of consciousness by chloroform, abolishing first the higher faculties and descending gradually to the lowest, may be considered as reversing that ascending genesis of consciousness which has taken place in the course of evolution; and the stages of descent may be taken as showing, in opposite order, the stages of ascent. It is significant, therefore, that impressions from the special senses, ceasing early, leave behind, as the last impression derived from without, the sense of outer force conceived as opposed by inner resistance; for this we saw to be the primordial element of consciousness. (§ 347.) Again, the fact that the consciousness of external space disappeared simultaneously with the consciousness of external force, answers to the conclusion drawn that space-ideas are built out of experiences of resistant positions, the relations among which are measured by sensations of muscular effort. (§§ 343, 348.) Further there is meaning in the fact that a vague sense of relative position within the body survived; since we concluded that by mutual exploration there is gained that knowledge of the relations among the parts of the body, which gives measures through which the developed knowledge of surrounding space is reached. (§§ 344, 345.) Once more we get evidence that the Ego admits of being progressively shorn of its higher components, until, finally, the sensations produced by the beating of the heart, remain alone to constitute the conscious self: showing in the first place, that the conscious self at any moment is really compounded of all the states of consciousness, presentative and representative, then existing (§ 219), and showing, in the second place, that it admits of being simplified so far as to lose most of the elements composing the consciousness of corporeal existence. Whence it is inferable that self-consciousness begins as a mere rudiment consisting of present sensations, without past or future. Lastly, we have the striking testimony that there exists a form of consciousness lower than that which the lowest kind of thought shows us. The simplest intellectual act implies the knowing something as such or such—implies the consciousness of it as like something previously experienced, or, otherwise, as belonging to a certain class of experiences. But we here get evidence of a stage so low that a received impression remains in consciousness unclassed: there is a passive reception of it, and an absence of the activity required to know it as such or such.

The Semicircular Canals and the "Sense of Space".—M. Elie de Cyon, who in 1873 published in *Pflüger's Archiv* an important research into the functions of the semicircular canals, has since then continued his investigations, and arrived at new or more developed results which he has recently set forth, first in the *Comptes Rendus* (1877), and more fully in a graduation-thesis presented to the Paris Faculty of Medicine (*Recherches experimentales sur les fonctions des canaux semi-circulaires et sur leur rôle dans la formation de la notion de l'espace*, 1878).

His earlier results were, shortly, these:—

(1) Through the semicircular canals we obtain a series of unconscious sensations bearing on the position of the head in space.

(2) Each canal has a strictly determinate relation to one of the dimensions of space.

(3) The loss of equilibrium and other disorders of movement observed upon section of the canals are due to disturbance of the normal sensations of which they are the organ.

These results were opposed to the views of earlier observers, more especially of Flourens, who led the way in 1828 by declaring the canals to have a moderating function in regard to the co-ordination of movements effected by the cerebellum, and of Goltz, who in 1868 (*Pflüger's Archiv* III.) pronounced the canals to be themselves the organs of equilibrium and of the co-ordination of movements. Cyon's other researches had led him wholly to disbelieve in the existence of any special organ of co-ordination for all the movements of the body, and he could only judge (so far agreeing with Goltz) that in point of fact the preservation of the bodily equilibrium did depend on the maintenance of the head's position, since the marked disorder wrought in the latter by section of the canals was found to affect the former so seriously. The positive feature of Cyon's view of the canals was the relation he sought (as far as he then could) to establish between the apprehension of space in three dimensions and the reception of (unconscious) impressions from the three canals in their different planes.

As to the precise conditions under which the impressions were received, he then, in his published memoir, hazarded no opinion, though Goltz had asserted as part of *his* theory that the (co-ordinating) function of the canals was called into play by the pressure of the endolymph on the ampullae as it varied with the movements of the head. But later investigators—Mach, Crum Brown, and Breuer—having meanwhile connected this supposition of Goltz's with a new theory of the canals, namely, that they are the organs of the sense of accelerated movement and rotation, it was in this special regard that Cyon was moved to resume and carry further the whole investigation.

He now finds, by a most varied series of experiments, a complete confirmation of the opinion he had originally, in 1873, been driven to entertain but refrained from expressing—that the cause of the excitation of the canals is not to be sought, with Goltz, in varying pressure of the endolymph; also, that the supposition is equally

inadmissible in any of its modified forms as adopted by Mach and the others. The theory these put forward as to the function of the canals must also be rejected, on a variety of grounds. Thus it is found that vertigo continues to be produced by rotation after section of the nerve going to the canals. Again (Cyon urges), the canals are equally developed in animals, like frogs, that do not naturally rotate the head, and cannot therefore be supposed to have any special connexion with this kind of movement; while neither can a sense of acceleration be allowed, as the theory requires, to the exclusion of a sense of speed, nor, involving, as it obviously does, a number of conscious factors, can it be thought of as seated in the canals which themselves give rise to no conscious sensation.

Reverting, therefore, to his original view, Cyon finds, by a new series of experiments on pigeons (extending, as his earlier ones did not, to the superior vertical canal), that section of any two symmetrical canals excites oscillations of the head in the plane of the said canals, and this he lays down as an absolute law admitting of no exception. The movements of the body, in the like circumstances, are less easy to analyse, but have, speaking generally, the same direction as those of the head. Destruction of the whole six (membranous) canals with their ampullae, when successfully performed, leaves the pigeon, after a time of indescribable motor disturbance, in the state as of one that has to learn to move, to stand upright, &c.: gradually it acquires a certain power of standing and walking, if it has the use of its eyes, but it can never again fly. Unilateral section is attended in general only with a passing disturbance, even when it extends to all three canals; but the operation discloses—what Cyon (previously following Goltz) had not before observed—disorder of bodily equilibrium apart from any change in the head's attitude.

So much for pigeons. Experiments on rabbits, while yielding similar results with minor differences, reveal a new fact to which Cyon attaches special significance, namely, ocular movements apart from movements of the head, while varying, like the others, in direction according to the different canals excited. Cyon had always surmised that there must be a connexion between the canals and the oculo-motor centres, considering the importance of the part played in the perception of space by "the unconscious sensations arising from the ocular muscles themselves or their centre of innervation". Now that every excitation of the canals, however small, is actually found to produce contractions and innervations in the ocular muscles, he regards it as incontestable that the nerve-centres for the canals are in intimate physiological relation with the oculo-motor centre, and consequently that the excitation of the canals enters into the determination of our space-notions. This, accordingly, is his formal conclusion:—

"The semicircular canals are the peripheral organs of the sense of space; that is to say, the sensations excited through the nerve endings in the ampullae of the canals serve to form our notions of the three dimension of space—the sensations of each canal corresponding with one of the dimensions. By means of these sensations there is formed

in our brain the representation of an ideal space, to which are referred all the perceptions of our other senses concerning the disposition of objects around us and the position of our body among these objects."

Cyon proceeds next to explain and justify this position in relation to the current theories of space-perception, leaving over, however, for separate treatment its more purely philosophical implications. Taking Helmholtz and Hering as representatives of the empiristic and of the nativistic theories, respectively, in their most developed form, he agrees with Helmholtz in rejecting Hering's view that every optical sensation, at any point of the retina, has bound up with it a definite spacial reference; but, while admitting that the empiristic theory accords altogether better with accepted physiological notions and with observed facts, he does not see, any more than Lotze (whom he quotes at length), how it can account for a representation of space in three dimensions from sensations of muscular innervation, with or without the association of 'local signs'. Instead, however, of therefore declaring the problem insoluble by physiological psychology and falling back upon a native mental faculty or tendency to perceive impressions under the form of space, as Lotze does, Cyon maintains that all the difficulties disappear if only it is admitted that we possess an organ "specially destined to furnish us with the sensations that serve to form the notion of a space in three dimensions," like the semicircular canals. The disposition of the nerves in the canals being in three planes perpendicular to one another—planes that in all vertebrates correspond, he says, exactly with the three co-ordinates of space—we can very well, Cyon thinks, understand how the "unconscious sensations of extension" that we get differently from each canal, "may be used by our intelligence for the construction of a notion of space"; and he would even maintain that "no other sense presents so intelligible a relation between representation and sensation as does the sense of space," upon this view of it. So extended, the empiristic theory becomes perfectly satisfactory. The sensations of muscular innervation, aided by 'local signs,' which that theory puts forward, have a real significance when space itself in three dimensions is proved to be an independent "acquisition of our intelligence due to the special sensations of a peripheral organ, just as the notions of colours, sounds, &c., are". And "this ideal space of three dimensions, the notion of which is formed by means of the sensations received from the three canals, serves of course equally well for determining the relation of objects in the external world by touch" or by whatever other senses, as some think, may be called into play for the purpose.*

In the remaining sections of his dissertation Cyon first sets himself to explain the phenomena of visual vertigo, produced by sudden stoppage of rotation round the longitudinal axis of the body; describing the state as one in which "the whole of space seems to us

*Cyon also makes the remark, which doubtless he intends to follow out when drawing his promised philosophical conclusions, that his view explains the tridimensional character of Euclidean space; the geometrical axioms being imposed by the limits of our sense-organs.

to turn within another imaginary space, in a direction opposite to that of the movement of our body". He rejects as insufficient the common view—which makes this vertigo dependent on movements of the eyeballs, causing us, in the absence of the normal sensations of innervation, to ascribe the movement of the retinal images to a movement of the external objects themselves; and would account for this and all other illusions of movement by disharmony between our perceptions at the time and our standing representation of ideal space obtained, as above, through the semicircular canals. The demeanour of animals whose canals have been operated on has all the appearance of being due to vertigo—a vertigo that must, he says, be ascribed to the disordered "sensations of space," whether or not accompanied by oscillations of eyes and head intensifying it. As for these muscular accompaniments, Cyon now believes he is in a position to say generally not only that they are secondary but that their diversity in different classes of animals depends on what the muscles are that are habitually employed by the animal for orientation in space. Thus while in pigeons, with excessively mobile heads, the disordered motion following upon the operation appears chiefly in the head-muscles, in rabbits it is the highly developed oculo-motor apparatus, and in frogs (with almost immobile head) it is the muscles of the body that are most affected by destruction of the canals. Altogether the results of lesions of the canals, from this point of view, may be thus summarised: (1) Visual vertigo produced by disharmony between space as seen and the ideal space; (2) False notions thence resulting as to the position of the body in space; (3) Disorder in the distribution of the force of innervation to the muscles.

What now may be supposed the normal excitant of the nerves in the canals, resulting in the sensations that serve thus for the construction of space? Though the hypothesis of Goltz and Mach—as to varying pressure of the endolymph upon the ampullae with movements of the head—must be rejected, Cyon thinks the nerve-endings in the ampullae and canals are sufficiently exposed otherwise to mechanical stimulation. The otoliths, found not only in the saccules but also in the ampullae and the canals themselves, are liable to vibrate with every movement, active or passive, of the head; and, besides, the numerous epithelial cells in the canals, so strangely formed and disposed in relation to the nerve-ends, may very well be a means of exciting the nerve-fibres that oscillate in the liquid. Nor need the excitations be only through motions of the head: the air-waves, both when sonorous and not, may also be efficient (in which connexion the faculty of recognising the direction of sound, so highly developed in savages and some animals, may be called to mind).

The sensations themselves that arise, continues Cyon, being unconscious, as the sensations of innervation also are, their character cannot be very particularly described. But, he urges, if it be remembered that sensations never are anything more for our intelligence than distinct signs whereby we form our representations, on the one hand it is not at all necessary for the formation of our notions of space

that the sensations excited through the canals should contain in their nature "the idea of an extension"; while yet, on the other hand, the anatomical disposition of the nerves here, in three planes perpendicular to one another, gives a quite exceptional "facility of deducing the formation of the representation from the nature of the sensations".

Belonging to the eighth pair, with the nerve of hearing that goes to the cochlea, the nerve of the canals is commonly also called auditory; but there is no longer any excuse for this confusion. The destruction of the canals does not destroy hearing; and while in the lower grades of animal life, where the cochlea first disappears, the faculty of hearing seems to disappear also, the more indispensable power of orientation in space remains in connexion with the canals and saccules that persist still. There should, therefore, be distinguished from the nerve of hearing in the eighth pair (which has besides, in fact, two origins) the "nerve of space"—"serving for the orientation of the body in space in animals, as in man for the formation of the notion of space".

The foregoing summary of the main points in Cyon's important dissertation should suffice to show that psychologists can no longer afford to neglect, as they have mostly done hitherto, the series of physiological inquiries into the functions of the semicircular canals, of which his is but the latest and most thorough. If there is any meaning in the psychologist's reference to organic conditions, it is impossible, in the face of the facts noted above, not to allow that in the semicircular canals we have to do with organs of great importance for the psychophysical theory of objective perception. In saying this, however, one may well refuse to fall in straightway with Cyon's particular interpretation of the facts. Saying nothing of difficulties in the facts themselves, which Cyon skims over with a strange unconcern —as when he assumes that the symmetrical pairs of vertical canals have common planes—what is to be made of his space-sensations that are unconscious but yet discriminable? And how concede the absolute analogy he would establish between space and any other sensible experience? To say, as he does, that the unconscious character of the canal-sensations is no greater difficulty than in the case of the feelings of muscular innervation will not avail him, because those who attach real importance to these in the development of our space-perceptions hold them to be conscious states as much as any passive sensations; while, as for the other point, his own assertions may be turned against his view that space is just such another sensible experience as sound or colour. Though he sometimes speaks of space as a simple datum in consciousness on occasion of the stimulation of the canals, its organ, his common expression is the much more careful one—that the canals yield directly only those (unconscious) sensations out of which, as signs, the notion of space is formed. But here, surely, is a great difference. When colour or sound is referred to a physical organ, the meaning is that upon occasion of that organ being stimulated there does, in point of fact, arise in consciousness a feeling of a certain definite quality; and though we may speak of a "notion

of colour" as becoming "formed," this is only as a generalised expression of the variety of colours immediately perceived—not as if the experience of colour itself were a mental construction out of simple and different elements of experience. So much, however, is this the case with space, upon Cyon's view, that he holds it quite unnecessary, for the due and normal formation of the "notion" out of the "sensations," that the nature of these should contain at all "*l'idée d' étendue*". Be it so: but then the difference between our experience of space and the passive sensations stands plainly confessed. And there is another objection with which Cyon must reckon. Why, if, as he allows, it is possible to form a notion of space out of elements not containing in themselves "the idea of extension," should it be impossible, as the empirists hold, to construct the notion out of feelings of innervation, &c.? The whole point of his case against them lies in the disparateness between the elements they assign and the result they profess to attain. But his elements are disparate too. Either, therefore, the empiristic position is not so untenable as he represents it, or it is made no whit stronger by the addition of any such "space-sensations" as he assumes by way of the semicircular canals, and there is no alternative but, with Lotze, to declare the problem insoluble in terms of experience. This, an opponent might say, is what Cyon in the end practically does—after all the trouble he has taken to establish his new and all-important empirical factor.

EDITOR.

VIII.—NOTES AND DISCUSSIONS.

Logic and the Elements of Geometry.—Dr. Hirst, on retiring lately from the presidency of the Association for the Improvement of Geometrical Teaching, has taken notice of some observations made by me, in the first number of this journal, with reference to the Logical Introduction to the *Syllabus of Plane Geometry* issued by the Association in 1875. As it is very important that logical theorists on the one hand and scientific workers or teachers on the other should lose no opportunity of mutual understanding, Dr. Hirst's remarks are (with his permission) here reproduced from the Association's *Report* for this year, and some words of explanation are appended in reply. Dr. Hirst says:—

"The Editor of MIND, after drawing attention to the diversity of meaning attached by geometers on the one hand, and pure logicians on the other, to the words 'converse' and 'obverse,' concedes that these terms are so appropriate for his purpose that the geometer is fairly entitled to appropriate them in his own sense. Immediately afterwards, however, he protests against what he considers to be an error on our part, but what in reality is no error at all, but a necessary sequel of the concession he has just made. With regard to the two

propositions which stand first in our Logical Introduction—the typical forms of which, if you remember, are—

(1) If *A be B, then C is D.*
(2) If *C be not D, then A is not B.*

he deems it inaccurate to say, as we do, that they are contrapositive *each of the other.* He admits that the second is contrapositive to the first, but denies that the first is contrapositive to the second, and this because the process of contraposition is, to him, obversion followed by conversion, and not conversion followed by obversion. He overlooks the fact, however, that these processes of obversion and conversion, as understood by the geometer, may be applied in either one or the other order, successively, without at all altering the final result; so that if once the propriety of terming the second of these propositions the contrapositive of the first be conceded, it can no longer be contested that the first must also be termed, by the geometer, the contrapositive of the second. Of course, it is admitted, on both hands, that these two propositions are logically equivalent, and therefore it might, at first sight, appear that the question at issue is merely one of terminology. This is, however, by no means the case. In fact, the writer himself admits that 'this is no mere question of naming,' and he justly observes that 'if it is important for learners to distinguish between a geometrical process and one purely logical, as the placing of this Logical Introduction at the head of the *Syllabus* implies that it is, there can be no controversy as to the necessity of exactly determining the character of the logical processes involved'. On this point I can only say that it was unquestionably our intention that the teacher should supply the determination here desiderated. It was not thought consistent with our purpose, however, to introduce these explanations into the *Syllabus*, and I, for my part, regret that such was the case, since our omission has led to misapprehensions of a still graver character than the one I have now alluded to. I was hardly prepared to find that, 'in default of special instructions,' even an accomplished logician finds himself unable 'to draw from the examples of contraposition signalised throughout the *Syllabus*, a consistent notion of the process,' and I was still less prepared for the authoritative declaration that 'it is impossible to frame *any* notion of the process of contraposition which shall apply, as required in the *Syllabus*, equally to affirmative and negative propositions'. Let us see if the geometer's notion of contraposition—for a notion he certainly has—is really so restricted. He first of all distinguishes carefully between the two parts or statements involved in every theorem; the truth of one of these—the predicate—is asserted to be a consequence of the truth of the other—the hypothesis. Now to each of these two statements, no matter whether it be of an affirmative or negative character, there is a distinct opposite, by which I mean a statement which directly contradicts the original. This granted, the process of contraposition may be said to consist, simply, in the formation of a new theorem whose hypothesis shall be the opposite of the predicate of the original, and whose predicate shall be the opposite of

the former hypothesis. From this it will be seen that the process is not affected in the least by the affirmative or negative character of either the hypothesis or predicate. It is further obvious that the process of contraposition, thus defined, is a composite one. It consists, in fact, of the interchange of hypothesis and predicate, which is conversion, accompanied by the denial of hypothesis and predicate, which in itself constitutes obversion. And it is moreover evident, lastly, from what has been explained, that it is a matter of perfect indifference which of the two last-named, successive processes we first apply; so that if of two theorems one is the contrapositive of the other, then from our point of view, necessarily, the first is also the contrapositive of the second; in other words, the relation we characterise by the term contrapositive is a perfectly reciprocal one."

Thus far Dr. Hirst. In reply, I may perhaps be allowed to remind those who take an interest in this subject that the point of my observations was to urge the advantage and even necessity of extending the reference so laudably made in the *Syllabus* to the processes of logical transformation of propositions. The occasion was of this kind. While some steps are marked off in the *Syllabus* as purely logical and are called by their recognised names, certain other processes of an extra-logical character are called by the name of the logical processes to whose type they may be said to approach. Thus the purely logical process in passing from (1) to (2) above is called, as logicians now call it, Contraposition, but the logicians' word Conversion is employed to mark such a step as that from *If A is B, C is D* to *If C is D, A is B*, which is not good in logic. Now, as explained in my original Note and here repeated by Dr. Hirst, I did not complain of this; and indeed it was I that recommended to the Association the use of the logical word 'obverse' (for what in the previous modern books was very perversely called 'opposite') in a like transitive application. But then it clearly becomes very important that there should be no confusion between the original and derived use of the words, and I did not see how this could be avoided except by a more explicit statement of the fundamental logical processes than the *Syllabus* offered.

How real the danger is, Dr. Hirst must pardon me for thinking that his own remarks now show. When I say that Contraposition involves first Obversion and then Conversion, he, having occasion to use these latter words, as a geometer, in the extra-logical sense, supposes that I must mean them thus here, and blames me for not seeing that the geometer may apply the processes indifferently in any order. But if Contraposition is, as all allow, itself a purely logical transformation, there can be no question of resolving it into anything but *logical* Obversion and Conversion; nor can the fact that the geometer may equally well begin with either of *his* steps first, in any way affect my logical statement. I deny, of course, that the logical process of Contraposition consists of the two extra-logical processes in any order. If (1) is 'obverted' into *If A is not B, C is not D*, no doubt this being logically converted becomes (2); but, as is very properly re-

marked in the *Syllabus*, the first step is not warranted in logic, and it surely cannot be assumed in order to arrive at the legitimate contrapositive. If, on the other hand, we begin by 'converting' (1) into *If C is D, A is B*, here no doubt, with the help of the original proposition, we are entitled to pass to the so-called 'obverse' *If C is not D, A is not B*, but the extra-logical 'conversion' was illogical. Either way, then, it is no true account of Contraposition to say that it consists of Obversion and Conversion in the extra-logical sense given to them by the geometer. Contraposition can be understood as involving Obversion and Conversion only in the strict logical sense; and in this sense the question of order is not indifferent. You can get (2) from (1) logically only by Obversion followed by Conversion; you can get (1) from (2) logically only by Conversion followed by Obversion. If in either case the order of procedure is reversed, the result would be quite different. Now, if there happen to be reasons for calling by the name of Contraposition that order of procedure in which Obversion is taken first, the name cannot without confusion be applied to the reverse order which yields a quite different result; and this is what I maintained when I denied that the passage back from (2) to (1) is properly to be described as Contraposition, and declared it impossible to frame any notion of the process that shall apply equally to affirmative and negative propositions. Dr. Hirst, indeed, gives us, in other language, a view of Contraposition that seems to apply generally; but, however it may meet the practical requirements of the geometer, it only discloses anew the logical difficulty. When he divides a theorem into the two parts which geometers (again making perverse use of logical language) call hypothesis and predicate, and tells us to substitute the 'opposite' of each for the other in Contraposition, how is it known that this is an admissible substitution? The geometer will not be able to reply without entering into precisely those elementary logical considerations which it was my plea to have explicitly set out at the beginning of a geometrical course.

The particular point at issue—whether the passage from (2) to (1) above may equally well with the passage from (1) to (2) be described as Contraposition—is settled for the logician (to whom the question belongs) by a reference to the origin of the process so named. Contraposition arose out of Conversion. While the typical propositions *A, E, I* might all be converted in one way or another, the particular negative *O* —*Some S is not P*—proved inconvertible. Was there then no way of making the subject *S* stand as predicate? Yes: by obverting the proposition into what used to be called its 'equipollent' *Some S is not-P*, this could be converted (as *I*) into *Some not-P is S;* and the process was called Conversion by Negation or Contraposition, also in course of time simply Contraposition. No sooner, however, was it recognised, than the question must arise whether it was applicable to *O* only. It could not, indeed, be applied to *I*, because *I* being obverted into *O* could not then be converted; but it could be applied to *A* and *E*. Only, whereas in Conversion *A* suffered (being degraded from *All S is P* into *Some P is S)* but *E* retained its universality

(*No S is P* becoming *No P is S*),—in Contraposition, on the other hand, while *A* retained its universality (*All S is P* becoming *No not-P is S*), *E* suffered (being degraded from *No S is P* into *Some not-P is S*). Now, upon this showing, it is quite clear, as I argued originally, that theorem (2) above, corresponding as it does with the categorical *E*, cannot by this way of Contraposition be brought to (1). It can be brought to (1) only by being first converted and then obverted—a perfectly valid logical transformation, but not Contraposition. When contraposed, (2) becomes the very different proposition *In some case when A is not B, C is not D.* In short, (1) and (2) cannot be called mutually contrapositive except by a new definition of Contraposition, which shall make it cover Obverted Conversion as well as Converted Obversion. Is such a definition possible? Of course, it is possible—at the expense of logical usage: when I declared it impossible, it was on the supposition that logical usage should be maintained. Is it advisable as well as possible—advisable, that is to say, for the practical purposes of the geometer? I care not even if this should be asserted, because I am sure that the definition cannot be satisfactorily given except as based upon such an explicit reference to the fundamental processes as would satisfy any logician—when the whole business, indeed, becomes "a mere question of naming".

I end with one more remark, already thrown out in MIND III., p. 425, but which, in view of these misunderstandings, I would now accentuate. It is that geometers should abandon the use of the logical terms *converse* and *obverse* for extra-logical relations. The terms *inverse* and *reciprocal*, used by M. Delbœuf in his *Prolégomènes philosophiques de la Geométrie* (Liége, 1860), p. 88, are equally significant, while they lead to no confusion with the purely logical processes that should be familiar to every scientific reasoner—Obversion and Conversion as well as Contraposition. EDITOR.

Hegelianism and Psychology.—Some books that have lately appeared in Germany—Prof. C. Hermann's *Der Gegensatz des Classischen u. Romantischen in der neuern Philosophie* (1877), *Hegel u. die logische Frage in der Gegenwart* (1878), and Dr. G. Biedermann's *Philosophie als Begriffswissenschaft*, Th. I. (1878)—are remarkable as indicating a revival of interest in a view of philosophy which has been, so far as the public is concerned, extinct there for at least a quarter of a century. Prof. Hermann and Dr. Biedermann both accept the fundamental positions of Hegelianism, while they differ from Hegel, and from each other, in their views of the dialectical method which springs from these positions. How far they are right or wrong in their criticisms on this head, we will not here inquire; but there is some interest in the view taken by both of the significance of the system in its relation to Kant and to empirical psychology.

Hume's method was substantially the one which is common to all empirical science. Mind and externality, which, taken *per se*, are mere abstractions, are for him (to use Berkeleian language) phases of

that *percipi* which is their *esse*, and his method of investigating knowledge is to treat it as itself an object of knowledge, as something given, and, in a sense, external to the mind which is observing it. To this procedure Kant took exception, on the ground that it was incapable, from its very nature, of returning an answer to the question, How is knowledge itself constituted? It is probably true that Kant was justified in his objection, in so far as he meant that Hume's method, in making the act of knowing itself an object of knowledge, could never comprehend it as the active synthesis, in which, according to the former, all existence finds its ultimate meaning and constitution. When we make the act of knowing itself an object of knowledge, we do not observe it in the aspect in which it is the *esse* of existence, but we at once come under the necessary condition of all experience, the separation of the known object from the knowing subject as distinct from and independent of it. And if Hume ever intended to transcend this separation he certainly failed. Kant, accordingly, seeing that ordinary psychology could never throw any light upon the relation of subject and object, and finding, as he thought, a certain universality and necessity in mathematical and causal judgments, which was inexplicable from mere experience, laid hold of these as points from which the metempirical conditions and elements of knowledge could be inferred, and through this method arrived at the conclusion that knowledge or experience (Berkeley's *percipi* in its widest sense) was constituted by the logical determination of the vague manifold of sensations in certain definite and primary syntheses of pure thought, in time and space, the two *à priori* forms of sensibility. There can be no doubt that, although Kant professed to arrive at this conclusion strictly by means of his critical method, he really did so by the help of the old psychological procedure, and the confusion arising from this fact was intensified by the vague meaning of the two words 'universality' and 'necessity'. Kant might just as well, so far as metaphysical results were concerned, have started from any other point in experience (*e.g.*, the conception of quality), but he was led specially to the consideration of mathematical and causal relations by Hume, and his critical method consequently retained (as indeed from its nature it was bound to do) a decidedly psychological character and tendency.

Hegel, having had this brought under his notice by the immediate successors of Kant, and particularly by Schultze, Maimon, and Fichte, seems to have set his mind towards getting entirely rid of the psychological character of Kant's system, and accordingly he denied *in toto* the possibility of ascertaining the metempirical constitution of knowledge by inferring the conditions of its possibility from the facts of experience. Seeing that the *quasi*-separation made by Kant between the faculties was only possible so long as they were conceived as, in some sense, objects of experience (*i.e.*, known in time), Hegel adopted the only method left open to him, in treating the categories, the forms of sensibility (time and space) and, in fine, the whole of the constituent factors of knowledge, as logically reducible to intelligible

relations, contained in and forming a dialectical chain, each link of which presupposed, and, at the same time, was presupposed by, every other,—a doctrine suggested to him, no doubt, by the Aristotelian theory of the active reason. Starting with the most empty category, that of being, he shows that it is meaningless except as, by dialectical implication, involving and involved by every higher category; and this, it may be remarked, is really the only sense in which Hegel can be said to have propounded a doctrine of evolution.

Kant had thought it necessary to reserve a vague manifold of sensation, which the intelligible syntheses of pure thought might qualify and so give meaning to, but Hegel, considering that this reservation arose from the fact that Kant had never got away from the psychological standpoint, declared that that vague manifold had no meaning or existence except as constituted by intelligible relations, and that the reason of the impossibility of clearly tracing out the categories in nature was that the position of the categories of nature, in the dialectical development of the notion, was that of the contingent or dialectical correlative of the abstract relations of logic, the categories of spirit dialectically combining the two, just as becoming combines being and not-being. Space and time, the ground-relations of nature, imply an externality which makes it impossible to do more than trace in a shadowy form their dialectical relation among the categories of nature.

Hegel's philosophy is thus a theory of perception in which there is no other element but mind, and in which that word means, not, as with Kant, individual intelligence, but absolute intelligence, which realises itself in and constitutes the individual. Things-in-themselves are of course meaningless abstractions for a system in which knowledge is the ultimate reality, embracing existence within itself. The individual is a moment in its dialectical development, and is characterised by the distinction between subject and object, the mark of its finiteness. But, at the same time, in individual knowledge the absolute mind reaches self-consciousness.

These are the principles which Prof. Hermann and Dr. Biedermann in the main accept, although they differ from them in the schemes of their dialectical methods. Strange as they appear, they are really, when carefully assimilated, intelligible and complete as a system of metaphysics, but what they fail to afford is a solution of those great problems of empirical psychology out of which all philosophy really takes its rise. Kant met Hume upon psychological ground in the case of questions arising within the sphere of experience, and his philosophy is therefore of great psychological interest. But Hegel, in abolishing the psychological side of Kant's system, abolished, as it appears to us, every point of contact with that English empiricism against which the latter had directed his attacks, and out of which his theory of knowledge may be said to have arisen. Empirical psychology, involving, as it does, a distinction between subject and object, is for Hegel no doubt a branch of knowledge, falling within that sphere of the timed and spaced, that contingency, which has a place as a

logical moment in the Hegelian dialectic, but it is really nothing more. It has no special interest as throwing light on the problem of the constitution of experience, towards which it stands in just the same position as any other branch of empirical science, and is really no more akin to philosophy proper than is, for example, physiology. The individual has, for Hegelianism, two sides; one, in which it transcends and exists apart from time, and is of interest as a logical moment in the system of the absolute; the other, in which it is known as existent in time, and in which it belongs more or less to the sphere of nature and contingency. It is in this latter aspect alone that it is an object of experience, and it, *ipso facto*, is, as such, dialectically unintelligible. It may be quite true that in the constitution of the most indefinite sensation there are involved intelligible relations, but these relations, on Hegelian principles, can never be exhausted or systematised, nor can empirical psychology either deny their existence or take account of them. It may be true that thought constitutes its object by processes which do not lie within the sphere of time, but for empirical observation, which can take account only of temporal co-existences and sequences, this fact has no significance. The two views of mind belong to different spheres, and the *onus probandi* of showing that they come into any conflict, or even contact, lies upon those who say that it is a fault in empirical psychology that it looks at no method but its own. It is enough to say that its justification as against the post-Kantian German philosophy appears to rest upon precisely the same grounds as the justification of every other branch of empirical science.

R. B. HALDANE.

The Rule of Three in Metaphysics.—I expected to see in a later number of MIND some reference to the argument set forth in the concluding section of Prof. Clifford's article "On the Nature of Things-in-themselves," contained in No. IX.; but such expectation not being realised, I venture to take the matter up myself.

I cordially agree with the whole of the article in question except the section above-mentioned; but in that section there seems to me to be a glaring *non-sequitur*. Towards the close of the preceding section Prof. Clifford enunciates the proposition "that every *motion* of matter is simultaneous with some ejective fact or event which might be part of a consciousness". Note the word "motion" not only here, but also in Prof. Clifford's corollary, No. 2, in the same section.

The proposition which prefaces the last section is the most important one in the whole article, being the one the author aims to prove.

The first objection I have to raise is to the following phrase:—"A *moving* molecule of inorganic matter does not *possess* mind or consciousness; but it *possesses* a small *piece* of mind-stuff". I presume Prof. Clifford here means that the mental eject corresponding to the motion of a molecule of inorganic matter is not a *conscious* one; but his proposition, in the way he states it, implies that each molecule carries about with it in its travels something that would still be attached to it if it ceased to move. Here lies a fallacy. Prof. Clifford seems to

have forgotten his own statement that the *motion* of matter is the concomitant of the ejective fact.

The same fallacy lurks in the subsequent argument. The supposition is made "that I see a man looking at a candlestick". A "cerebral image" is formed in the neighbourhood of his optic thalami. "This cerebral image is a certain complex of *disturbances* in the matter of these organs"; and yet we are told in the next breath—"Both the candlestick and the *cerebral image* are *matter*". Here again is the fallacy. The cerebral image is not matter but a complex of molecular *movements*—an important distinction.

Prof. Clifford then proceeds to point out that, besides the cerebral image and the candlestick, there are a mental image and an external reality, and that "the external reality bears the same relation to the mental image that the (phenomenal) candlestick bears to the cerebral image". So far all is well. But now Prof. Clifford repeats the fallacy above-mentioned, *viz.*, that "the candlestick and the cerebral image are both matter; they are made of the same stuff". But even apart from this objection, his conclusion—"Therefore the external reality is made of the same stuff as the man's perception or mental image, that is, it is made of mind-stuff"—does not follow at all. This will be seen more clearly if we put the argument in symbolical language:—

Let A = the external reality,
B = the candlestick, or my perception of the external reality,
C = the man's cerebral image as a possible perception of mine,
D = the man's mental image.

Then as B : C : : A : D; and therefore B and C being made of the same stuff (matter), A and D are also made of the same stuff (mind). The general proposition implied is that, if the same relation subsists between any two things, A and D, as subsists between two others, B and C, then, if C is made of the same stuff as B, D must be made of the same stuff as A, or *vice versâ*. This general proposition Prof. Clifford does not attempt to prove, though it stands in need of proof.

Again, even if the general proposition were true, it does not apply here, because B and C are *not* made of the same stuff, one being *matter* and the other *motion*.

The only tenable conclusion that Prof. Clifford can, in my opinion, arrive at, is that (quoting his own words), "as the cerebral image represents imperfectly the candlestick, in the same way and to the same extent the mental image represents the reality external to his consciousness". In other words, the agreements and differences obtaining in consciousness correspond to agreements and differences obtaining in a world outside (or rather independent of) consciousness.

JNO. T. LINGARD.

The Foundation of Arithmetic.—"Wherein (asks Mill) lies the peculiar certainty always ascribed to the sciences" of Geometry and Arithmetic? "Why are they called the Exact Sciences? Why are mathematical certainty and the evidence of demonstration common

phrases to express the very highest assurance attainable by reason? Why are mathematics . . . considered to be independent of the evidence of experience and observation, and characterised as systems of necessary truth?" The rational curiosity expressed in these queries will find small satisfaction in the answer of Mill, who replies that the "character of necessity ascribed to the truths of mathematics, and even, with some reservations, the peculiar certainty attributed to them, is an illusion; in order to sustain which it is necessary to suppose that those truths relate to, and express the properties of, purely imaginary objects".

Like most of those who have addressed themselves to this abstruse and complicated inquiry, he has encumbered his path by aiming at once at a general solution of the problem, and framing the discussion in terms intended from the first to meet the case of both demonstrative sciences. But the more abstruse is a subject, the easier it is for error to slip in under the cover of generalities, and it will greatly increase our chances of success if we confine our attention in the first instance to the more simple conception of Number, and afterwards turn, with whatever insight we may have obtained into the evidence of arithmetical certainty, to the more complicated relations of Position and Figure. The doctrine of Mill is, that Arithmetic, in the same sense as Mechanics or Optics, is an inductive science, resting on what are falsely called definitions, but are in reality generalisations from experience, inasmuch as they are to be understood, not merely as propositions explaining the meaning of the names Two, Three, Four, &c., but also as covertly assuming the existence of real things corresponding to such a meaning. "We may call 'Three is two and one' a definition of Three; but the calculations which depend on that proposition do not follow from the definition itself, but from an arithmetical theorem presupposed in it, *viz.*, that collections of objects exist, which while they impress the senses thus $^{\circ}_{\circ}{}^{\circ}$, may be separated into two parts, thus $^{\circ}_{\circ}$ $^{\circ}$. This proposition being granted, we term all such parcels Threes, after which the enunciation of the above-mentioned physical fact will serve also as a definition of the word Three."

The truth of the covert assertion thus implied in the definition of each specific number is a truth "known to us by early and constant experience, an inductive truth; and such truths are the foundation of the science of Number. The fundamental truths of that science all rest on the evidence of sense; they are proved by showing to our eyes and our fingers that any given number of objects, ten balls for example, may by separation and rearrangement exhibit to our senses all the different sets of numbers the sum of which is equal to ten".

Thus, according to Mill, the way in which we learn that the addition of a fresh ball to a group of two will produce a group of three and not of four, or that a group of four things may always be divided into two groups of two each and not into a group of two and one of three, is by inveterate experience only—by constant observation of the result when groups of actual objects are so combined and decomposed, just as we learn that sugar is sweet or snow cold. The bare statement

of such a conclusion in reference to numbers within easy grasp of the imagination should be sufficient to show that there must be some secret flaw in the reasoning which leads to so glaring a paradox. The source of the confusion in the mind of Mill may be traced to his fundamental doctrine "that no definition is ever intended to explain and unfold the nature of a thing". "All definitions are of names, and names only; but in some definitions it is clearly apparent that nothing is intended except to explain the meaning of the word; while in others, besides explaining the meaning of the word, it is intended to be implied that there exists a thing corresponding to the word." Definitions of this latter description consist of two parts; first, a proposition enouncing the meaning of the term defined, "which gives information only about the use of language, and from which no conclusions affecting matters of fact can possibly be drawn," and secondly, a covert postulate affirming "the real existence of things possessing the combination of attributes set forth in the definition," a fact which may lead to consequences of every degree of importance, and, if true, may be sufficient on which to build a whole fabric of scientific truth.

Now in the first place it cannot be admitted that definitions are of names only and never of things, that no definition is ever intended to unfold the nature of a thing. Whenever the word to be explained is the name of a thing of which the person to be instructed has no previous knowledge, the meaning can only be conveyed by explaining the nature of the thing signified. I explain the meaning of the word dragon, for example, to a person who has no conception of such an animal, by the definition—A dragon is a serpent which breathes flame; from which he will learn at the same time the meaning of the word dragon and the nature of the thing signified, without reference to the question whether such a creature actually exists or ever has existed or not. The hearer, who takes his notion of a dragon from this definition, will see *à priori* that every possible dragon must be a serpent and must breathe flame, because what he understands by a dragon is a creature characterised by the combination of those attributes; and if ever a dragon is to be found in actual existence, it must necessarily be by the apprehension of both the attributes in question.

In the same way it will be seen that every definition, rightly understood, must necessarily hold good of everything signified by the term defined, that is to say, that everything comprehended under that designation must inevitably be possessed of the character detailed in the predicate of the definition, because it is only by the exhibition of that character that it is made an example of what is signified by the term defined. Thus every definition, after it has performed its primary duty of indicating the sense in which the term defined is to be understood, will, when converted into an universal proposition, be recognised as a necessary truth, provided that the subject of the proposition, so understood, affords room for the question of the truth or falsehood of assertions concerning it. If no such thing as a dragon is to be found in the world, it cannot be said that the proposition, Every dragon breathes flame, is either true or false. It is manifest, however, that

the real existence of things signified by the term defined can be secured by no postulate or assumption, but only by positive knowledge of some individual in actual existence. The condition, then, which converts the definition of a dragon from an exposition of the meaning of a word into an assertion of positive fact will be no assumption of the real existence of serpents breathing flame, but the discovery of an animal so characterised in actual existence.

Whether the definition is to lead to a real advance in knowledge, or to remain a barren explanation of what is denoted by a certain term, must depend upon the question whether or no it is possible to deduce from it any attribute of the species defined that must not itself be directly apprehended in the recognition of an individual of the species in actual existence. If it could be shown that the notion of some ulterior attribute, not necessarily present to the mind in the conception of a serpent breathing flame, such for instance as the notion of carrying a hidden jewel in its head, was logically involved in the conception of a dragon, it would be manifest to those who followed the demonstration, that every actual dragon (if such there were in existence) must necessarily carry a jewel in its head, and the insight into that necessity, on the occurrence of an actual dragon, would give knowledge of a fact not directly perceived in the apprehension of that particular animal. But no conclusion of such a nature can be drawn from the definition, from which it can only be inferred that every dragon is a serpent and that it breathes flame; both of which propositions, to one who takes his conception of a dragon from the definition, are manifest truisms.

On the other hand the conclusions of Arithmetic confer a real advance in knowledge, because they predicate conditions of this or that particular number, which are not necessarily brought before the mind in the mere course of the operation by which the subject of the conclusion is recognised in actual existence. If each successive member of the series, one, two, three, four, &c., is defined by the continual addition of one to the preceding number, it will be easy to show from the definitions that any given number is the aggregate of various combinations of inferior numbers; that the number thirteen, for example, is the aggregate of seven and six, and the knowledge of this relation, in the mind of a person who is acquainted with an actual group of thirteen things, will show him with absolute certainty that that particular group may be broken up into a group of seven and one of six; a fact not necessarily made apparent in the mere numeration of the group of thirteen.

In our system of instruction Arithmetic is taught as an art and not as a science. The propositions of the addition and multiplication tables are given out as the tools with which the scholar is to work, without any attempt to deduce them from a logical analysis of the numbers themselves. But that is because Arithmetic is taught at so early an age that it is more important to fix the elementary relations of number in the memory of the scholar than to educate his power of speculative thought, and not from any inherent difficulty in a complete demonstration.

Number is the attribute apprehended by the process of counting, which consists in the recognition of successive objects as things of a certain kind, taking note, at the recognition of each fresh individual, of the extent to which the repetition of the kind has been previously carried. When the attention is simply directed to the fact of repetition, without distinguishing the degree to which it has been carried, the aggregate series is conceived as consisting of *many* things of the kind in question, and the contrast between the aggregate object apprehended in such a manner and that to which attention is directed at each repetition of the kind, gives rise to the conception of the latter as *individual* or *one*. Thus the idea of unity consists in a mental reference to the possibility of repetition of the kind to which the object is referred, or, what amounts to the same thing, in the negation of actual repetition, the negative character of the idea being witnessed by the form of the word *individual*—what is not broken up or divided into many. We should never have conceived an object as *one* unless we had previously had experience of something apprehended as *many*, but as soon as the notion of *one* has been evolved or abstracted in the way above-described, we see that *many* consists of one and one and one, and so on, until the entire group has passed under review. It is this relation between the ideas of plurality and unity which is expressed by Cousin under his somewhat mystical formula of the two contrasted orders of ideas; in the order of Time, he says, the idea of unity presupposes that of multiplicity, but in the order of Reason, multiplicity presupposes unity.

The lowest degree of plurality is where there is a single repetition of the kind; where a group consists of one object and one other of the same kind. The numerical character of a group of this nature is designated by the term Two, which may accordingly be defined by the proposition

Two is the aggregate of one and one, or, compendiously,
Two is one and one.

Our conviction that one and one are two, does not arise from uniform experience that a group of two things may always be decomposed in the form of one and one, but from consciousness, on the contemplation of our own thoughts, that what we mean by *two* is nothing else than the aggregate of one and one. In apprehending a group as consisting of two things, we do but bring under review at a single glance the elements which have been apprehended, in however transitory a manner, as one and one.

Having thus attained to the conception of the number two, we may imagine the addition of another unit to an ideal group of two, which will thus be enlarged to an assemblage of one and one and one, presenting to the mind the fundamental aspect of the number designated by the name of Three.

In like manner the mental association of an additional unit with a group of three will constitute a group of one and one and one and one, to which we give the name of Four, and so, by the addition of one to the highest number of which we had previously formed a definite con-

ception, we might continuously advance to the conception of a number one degree higher, so long as we were able to keep accurate count of the precise amount of repetition by which that particular step in the numerical scale was characterised. But such a limit, without some artificial aid of the memory, would very speedily be reached, and in the lowest stage of mental cultivation would probably not be placed beyond the number three or four. The requisite aid, however, is not far to seek, and is found by all the families of man in the quinary division of the hand, the fingers of which afford a ready scale on which to tell off the units of any group, up to five, of which one might wish to take count. Thus beginning with the thumb of the left hand, the first finger would mark a single repetition of the kind under enumeration, or a second member of the group; the middle finger a second repetition, or a third member of the group, and in this way primitive man would learn to associate a definite amount of repetition with each of his fingers, and might attain to a clear conception of the first five numbers antecedent to the use of any vocal designation. But sooner or later the demands of language would give rise to the use of spoken names, one, two, three, four, five, denoting the numbers told off on each successive finger; and these, being constantly repeated in regular order, constitute a series so rooted in the memory that each name serves at once to bring before the mind the preceding portion of the series, and thus affords a standard of the extent of repetition to which it corresponds, as distinct as that supplied by the fingers passed over in telling numbers on the hand. When the fingers on one hand are exhausted, we may either go through a second series with names of the form five-one, five-two, five-three, &c., which are actually found in many rude dialects, or the higher numbers may be told off on the other hand with a fresh set of names, six, seven, eight, nine, ten, corresponding to the fingers of the second hand.

When the ten digits are exhausted, we advance, by the continued addition of one, to the conception of higher numbers under designations of the form, ten-one, ten-two, &c.; two-tens, two-ten-one, &c.; three-tens, &c.; ten-tens, ten-ten-one, &c.; and so on, to an indefinite extent, using the convenience of compendious names for such of the powers of ten as may be convenient for resting-places in the process of numeration.

The composition of such a system of numbers is enounced in the following definitions:—

(2) Two is the aggregate of one and one, or, shortly,
Two is one and one.

(3) Three is two and one, &c.

(11) Eleven is ten and one, &c.

(20) Twenty is ten and ten, or two tens, &c.

(100) A Hundred is ten tens, &c.

By reference to these definitions the numerical value of all arithmetical expressions may be ascertained or compared with each other, because the definitions afford the means of reducing each of the systems in question, when necessary, to its constituent units, or of

building it up out of them, and thus of ticking off against each other the systems to be compared, unit by unit. To show, for example, that seven and six are thirteen, we have, by defn. (8),

Seven and one are Eight.

Adding one to each side,

Seven and one and one are Eight and one,

Or, by defns. (2) and (9),

Seven and two are Nine.

Adding one again,

Seven and two and one are Nine and one,

Or, by defns. (3) and (10),

Seven and three are Ten.

And so on, till we come to

Seven and six are Thirteen.

As the number of a set of things depends exclusively upon the length of the series, one and one and one, &c., where each 'one' of the series answers to an individual of the enumerated class as it is successively brought under review in the process of counting, without reference to any difference between one individual and another, it is plain that the aggregate number of the class can in nowise be affected by the order in which the individuals of the series are counted. If I have a series of balls, black, white, green, and red, the aspect under which I regard them in counting will be, one and one and one and one, whether I take them in the order of black, white, green, red, or of red, green, white, black. And so, if I jumble together a set of (m) white balls and a set of (n) black ones, the tale of the whole will be the same, whether in counting I pick out first the white and then the black, or first the black and then the white. In other words, the sum made by the addition of (n) to (m) is the same as that made by the addition of (m) to (n), or algebraically,

$$m + n = n + m.$$

In a similar way it may be shown that the product of two factors (m) and (n) is independent of the order in which the factors are taken; that (n) times (m) is the same as (m) times (n); or algebraically that $nm = mn$.

Suppose that we have five groups of seven balls each, it is obvious that the number will be seven times as great as if there were only one in each group, when the number would be only five in all; so that five times seven is the same as seven times five. Or to take the question more in detail, let the balls of each group be marked 1, 2, 3, &c., 7. Then there will in the aggregate be five ones, five twos, &c., and five sevens; making seven sets of five each. Thus it appears, from the nature of the conception, that things which are known as making five groups of seven each may be otherwise arranged in seven groups of five each, or, in other words, that five times seven is equal to seven times five.

If now we look back for a summary answer to the inquiry with which we set out, we find that our assurance in the universal truth of Arithmetic arises from seeing that the numerical equations which

form the body of the science are necessary consequences of the fundamental constitution of the numbers in question, as distinguished in thought or apprehended in actual existence.

The conception of every phase of Number consists, as we have seen, in a reference, more or less explicit, to a succession of units of definite length, wholly independent of the nature of the enumerated objects; and the demonstration of the numerical equation consists in showing, from the essential constitution of the numbers concerned, that the units contained in the combination on one side of the equation may be otherwise arranged in the groups indicated by the numbers on the other side. We show, for instance, that 7 times 8 is 56 by taking the units contained in 7 rows of 8 each, and showing, from the definitions, that they may be arranged in 5 rows of 10 each and one of 6. We find, from a gradual decomposition of the conceptions, that the mental operation, by which we enumerate the aggregate of seven groups of eight each, whether of balls or books or anything else, is identical with that by which we enumerate a group of 56, and thus we know with absolute certainty that things which are given us in the form of seven lots of eight each may be enumerated under the form of fifty-six.

HENSLEIGH WEDGWOOD.

IX.—NEW BOOKS.

Darwinism tested by Language. By FREDERIC BATEMAN, M.D., &c. With a Preface by Edward Meyrick Goulbourn, D.D., Dean of Norwich. London, &c.: Rivingtons, 1877. Pp. 224.

The author's special argument is imbedded in a number of observations on the doctrine of Evolution generally. He seeks to establish three positions: (1) that articulate speech is a distinctive attribute of man, the ape and lower animals possessing no trace of it; (2) that it is also a universal attribute, all races having either a language or the power of acquiring it; (3) that the faculty of speech is immaterial. This last proposition is opposed by the author to all the different attempts yet made to assign a local seat of speech in the brain: the pathological and other evidence, he maintains now, as he has maintained before, is dead against them all, Broca's included. The positive import of his proposition is thus disclosed:—"With these facts before me, I am tempted to ask whether speech, like the soul, may not be an attribute—an immaterial *nescio quid*, the comprehension of which is beyond the limits of our finite minds". He further declares for a spirit "or organ of God-consciousness" in man, which "differentiates him from the brute" possessing only a body and soul. Upon this it occurs to one to ask what Dr. Bateman means by "soul" in the earlier sentence. If he means all that is not body in man, he degrades the "spirit," with the animal life, into a mere "attribute"—which looks very like materialism. If, on the other hand, he means the kind of life we share with animals,—how, by comparing language

therewith, does he establish its distinctively human character? And, once more, is it language or is it spirit ("the organ of God-consciousness") that we are to take as the really differential element in man's nature? Dr. Bateman is not a very careful reasoner or writer.

The Dean of Norwich, who stands forward as sponsor for the work, argues about Evolution in Dr. Bateman's general strain, only more pointedly.

General Sketch of the History of Pantheism. 2 vols. Vol. I. From the Earliest Times to the age of Spinoza. London: Deacon & Co., 1878. Pp. 395.

The anonymous author describes his work as "merely an outline or epitome of a history," and as "chiefly a compilation, taken more frequently from translations and abridgements of the originals than from the originals themselves". After compiling in regard to Oriental and Greek Pantheism and sketching, in a fashion of his own, "the paganisation of Christianity and consequent decay of Pantheism" as far as the Rise of Scholasticism, he passes by a sudden stride to Servetus, Bruno, and Vanini, and will resume with Spinoza. It cannot be said that he compiles with such discrimination as to justify his work.

Proteus and Amadeus: A Correspondence. Edited by AUBREY DE VERE. London: Kegan Paul & Co., 1878. Pp. 184.

A veritable correspondence, under assumed names, carried on in 1876 between two friends—twenty years before pupil and master in a Catholic College—on the Existence of God and the human Soul. Proteus, the pupil, had strayed into "materialism" and Darwinism, accepting them intellectually but unhappy over them. Amadeus seeks to maintain the old orthodox positions against the modern objections. In the end the pupil is more than shaken; Darwin, as he allows, having "been hewed to pieces" for him by the master's "and Mivart's sword," and even Evolution being "emasculated and left harmless henceforth for ever". But still he cannot quite come back to the fold.

On the Nature of Things. A Science Primer. By JOHN G. MACVICAR, A.M., LL.D., D.D. With Illustrations. Edinburgh and London: Blackwood & Sons, 1878. Pp. 112.

"This work is grounded on the belief of an Almighty Being possessing unity, omnipresence, and ever-blessedness, and awarding existence to a creation for the sake of manifesting Himself and extending blessedness beyond Himself, and, in a word, to be a mirror of Himself, so far as the finite can bear a likeness to the Infinite. After setting out with this cosmical law of *assimilation*, by its aid alone bearing on only one kind of created substance or energy ('mind-stuff'), the author deduces the creation of the world of Spirits, and as their home the Universal Ether or medium of light. Then, as a beautiful cloudwork in the azure of the Spirit World, he gives the genesis of Matter and the molecular system, culminating in this planet in the construction of the myo-cerebral organism, whose characteristic function is to construct a powerful tissue of organised ether or

the matter of light, which, being unified in its focus of vital action into an element of energy so powerful as to have recovered the primal attribute of energy—namely, mental power—is a spirit. And thus creation, after a lapse into matter, becomes the mother and nurse of spirits again, destined, if the design of the Creator is fulfilled, to find a home in heaven, the realm of light, and there to experience the final fulfilment of the cosmical law of assimilation and be blessed for ever.

"The author, anticipating the criticism that all this is merely the fond imagination of one who disregards the now prevailing views of men of science, and who still clings to his theological education, has devoted more than half the volume to the verification of his theory by a detailed appeal to natural phenomena and experiments in physics and chemistry, which his theory enables him to deduce and account for, but which the most recent speculations in the science of the day leave still in the dark."

Comparative Psychology; or, *The Growth and Grades of Intelligence.* By JOHN BASCOM. New York: Putnam's Sons, 1878. Pp. 297.

The author in his preface says:—

"Without tracing the history of intelligence, we are not prepared to decide what is primitive and what is acquired, what is original material and what is the deposit of growth. The empiricist cannot be fully and fairly met without travelling with him these spaces of evolution, and determining at least their general character and laws. This I have undertaken in the present volume. It is my purpose to test the nature and extent of the modifications put upon human psychology by its relations in growth to the life below it, and in doing this to reach a general statement of each stage of development. . . . . I have derived great benefit from many forms of the Empirical Philosophy: these I cheerfully acknowledge, while I must remain its unflinching adversary. The Intuitional Philosophy can and should appropriate these excellent fruits, and this volume is the result of such an effort."

The Balance of Emotion and Intellect: An Essay introductory to the Study of Philosophy. By CHARLES WALDSTEIN, Ph. D. London: Kegan Paul & Co.

"The title of this forthcoming Essay indicates that it is meant to form an introduction to the study of philosophy. Its object is to contribute to the development of the philosophical attitude of mind. The author first attempts to counteract prevailing fallacies with regard to the false opposition of Emotion and Intellect, Common and Scientific Thought, the Exact Sciences and Philosophy. He then gives a short Sketch of the History of Philosophy."

Moralische Briefe. Von A. HORWICZ. Magdeburg: Faber, 1878. Pp. 126.

The author of *Psychologische Analysen* here appears in the character of a censor, exposing the sores of the German body politic, and only not despairing of his country's future. The Germans, he declares, are suffering from "blue-devils," manifested especially in the socialistic madness. The follies and affectations of fashion have laid hold on men and women alike. Trade and industry are vitiated by deception and sham. And while a gross materialism is the only creed of the masses, true culture in the higher grades is becoming ever more

rare. The socialistic movement, fraught to the author's imagination with all evil, he considers the natural outcome of the political and religious radicalism and scepticism which the masses have by this time learnt from the reckless outpourings of writers like Heine, Börne, &c. in a former generation. (He does not, apparently, connect it all with the oppressive military system and the unhinging effect of wars.) At the end he gives practical recommendations for the development of the civic virtue that he finds wanting, and in these there is much wisdom. Especially striking, and even powerful, is his statement of the individual's relation to society (§ 7).

Hegel und die logische Frage der Philosophie in der Gegenwart. Von Conrad Hermann. Leipzig: Schäfer, 1878.

"Hegel's logic was admired in its time as one of the greatest productions of the human mind. Since then there has been a reaction in favour of the common or formal logic of Aristotle. The present book is an attempt to carry out farther the thought of the Hegelian logic on a changed and improved basis. The whole position of Hegel in the history of modern philosophy is, in the author's view, analogous to that of Plato in antiquity. Just as Plato's logical doctrine attained its higher development in Aristotle's, so (the author thinks) does Hegel's point to a higher truth of philosophy and scientific use of the thought-principle."

Giacinto Fontana: *L'Epopaea e la Filosofia della Storia.* Mantova, 1878.

This book is a sequel and supplement to the *Idea per una Filosofia della Storia*, published by the author two years ago, and noticed in Mind V. History is viewed by him as either the progressive apprehension or the progressive realisation of the Idea or Absolute Being,—the development either of a contemplative or of an active principle. The former is to be studied in the history of religion and of science, the latter in the history of art, industry and commerce. The true philosophy of history he believes to be that which flows from the general philosophy of Plato, Vico and Mamiani. His admiration of it is intense, but his delineation of it is vague. He has, however, a wide knowledge of historical phenomena and the power of eloquently describing. On this account the present work is valuable, although it does not directly contribute much, perhaps, to the advancement of the philosophy of history. Its general aim is to show that in the history of epic poetry there are to be traced a humanitarian evolution of the Absolute and a progress both of intelligence and of liberty, both of the contemplative and the active principle; the priestly or hieratic class of epics corresponding to the former and the martial or warrior class to the latter. In the first four chapters the phantasy, the beautiful, the sublime, the ideal in primitive poetry, and the heroic in primitive poetry, are the subjects discussed. The following chapters have more special themes, namely, the Râmâyana, the Mahâbhârata, the Greek epics, the Latin epics, the cycles of (mediæval) Christian poetry, the epic cycles of paganism as influenced by Christianity, the Shahnameh,

the ideal in art at the epoch of the Renaissance, the romantic poems, and modern Christian epic poetry. The last chapter treats of the relation of epic poetry to the philosophy of history. The work is one which the general reader is sure to find both interesting and instructive.

R. F.

CARLO CANTONI: *Giuseppe Ferrari.* Milano, 1878.

This is a memoir read before the Institute of Lombardy. It commemorates the character and services of a man who has secured for himself a permanent place in the history of Italian philosophy. Scepticism has had few more subtle or thorough representatives than the late Signor Ferrari. Although he held many strange philosophical and political opinions and wanted sobriety of judgment, he was a man of most original and vigorous genius, an indefatigable labourer in the cause of science and progress, and the author of many learned, ingenious and brilliant works. Italy may justly cherish his memory with gratitude and pride. In this memoir the history of his outward life is clearly narrated, his character is sympathetically and judiciously delineated, and almost every work he wrote is summarised with great skill and judged with great equity. Signor Cantoni has admirably performed the duty devolved on him. It will interest those who are acquainted with his work on Vico, on the whole the best which has been written on the great Neapolitan, and his *Elementary Course of Philosophy,*—a book which if well translated would be very useful to students and teachers,—to learn that he is at present engaged on a Critical Exposition of the Philosophy of Kant, soon to appear in two volumes.

R. F.

X.—NEWS.

Mr. Grant Allen has nearly completed a volume for Messrs. Trübner on *The Colour-Sense, its Origin and Development.* He seeks to trace the causes and reactions of the colour-sense in insects, fishes, reptiles, birds, and mammals, and criticises adversely (as he has already shortly done in MIND IX.) the "historical development theory" of Magnus. Magnus's tractate has just been translated into French, with an introduction by M. Jules Soury (Germer Baillière).

Miss Hopkins is about to publish with Messrs. Kegan Paul & Co. a collection of the late James Hinton's Essays, uniform with the lately published *Life and Letters.*

Mr. Herbert Spencer has been made a Foreign Associate of the Accademia dei Lincei.

The statue-model by M. Frédéric Hexamer of Paris has been selected by the Spinoza Committee at the Hague from among those sent in for the second competition (which had become necessary), and the artist is now commissioned to prepare one on a larger scale.

THE JOURNAL OF SPECULATIVE PHILOSOPHY. Vol. XII., No. 2. J. Watson—'The World as Force'. Von Hartmann—'The true and false

in Darwinism' (transl.). Hegel—'Of the Classic form of Art' (transl.). Fichte—'Criticism of Schelling' (transl.). F. A. Henry—'Christianity and the Clearing-up'. Schelling—'The Historical Construction of Christianity' (transl.). Notes and Discussions. Book Notices. No. 3. J. E. Cabot—'Some considerations on the notion of Space'. W. James—'Brute and Human Intellect'. Hegel—'Of the Ideal of Classic Art' (transl.). Rosenkranz—'The Form and the Limits of Education' (paraphrased from Rosenkranz's *Pedagogics as a System*). Fichte—'Criticism of Schelling' (transl.). Notes and Discussions.

Revue Philosophique. 3me Année. No. VII. G. Compayré—'Origines de la Psychologie evolutionniste: La psychologie de Lamarck'. T. V. Charpentier—'La Logique du Hasard, d'après John Venn'. D. Nolen—'Les nouvelles philosophies en Allemagne'. Notes et Documents—'Le sens musculaire, d'après G. H. Lewes'; P. Tannery, 'Essais sur le Syllogisme, I. Les trois figures'. Analyses et Comptes-rendus. Rev. des Period. No. VIII. H. Spencer—'Études de Sociologie' (fin). Th. Ribot—'Les théories allemandes sur l'Espace tactile'. T. V. Charpentier—'La Logique du Hasard, d'après John Venn' (fin). Analyses et Comptes-rendus (Ferrier, *Lectures on Cerebral Localisation*, &c.). Rev. des Period. No. IX. W. Wundt—'Sur la theorie des Signes locaux'. N. Grote—'Essai d'une classification nouvelle des Sentiments'. F. Paulhan—'La théorie de l'Inconnaissable de H. Spencer'. Notes et Documents—V. Egger, 'Les *lapsus* de la Vision'; P. Tannery, 'Application de l'Algèbre au Syllogisme'. Analyses (Flint, *Theism*, &c.). Rev. des Period.

La Critique Philosophique. VIIme Année, Nos. 20-32. C. Renouvier—'L'appreciation des degrês de culpabilité' (20); 'Le principe de contradiction, le principe de l'inconcevable et la thèse du premier commencement' (21); 'Examen critique des principes de psychologie de H. Spencer: classification, &c.' (22), 'La question de la certitude' (24), 'La volonté' (25); 'La question de la certitude: Les postulats et le libre arbitre' (31), 'Le libre arbitre fondement de la certitude' (32). F. Pillon—'Frédéric Bastiat' (23, 31, 32). Bibliog. (Lafitte, *La Revue Occidentale* (26)).

La Filosofia delle Scuole Italiane.—Vol. XVII., Disp. 3. G. Barzellotti—'La critica della conoscenza e la metafisica dopo il Kant'. C. Cantoni—'G. M. Bertini' (II.). P. Ragnisco—'Le cause finale in Platone e in Aristotele'. J. C. Doni—'Del Coraggio'. Bibliografia, &c.

Zeitschrift für Völkerpsychologie u. Sprachwissenschaft.—Bd. X., Hefte 2, 3. F. Misteli—'Einiges zur Casuslehre'. M. Holzmann—'Der sogenannte Locativ des Zieles im Rigveda und in den homerischen Gedichten'. G. v. der Gabelentz—'Ein Probestück von chinesischem Parallelismus'. Beurtheilungen (Kussmaul, *Störungen der Sprache*, &c.). Br.—'Nachträge zur Lehre vom Stottern'. H. Steinthal—'Anmerkung'.

Philosophische Monatshefte.—Bd. XIV., Heft 6. Baumann—'Kurze Darstellung der Philosophie Franz v. Baader's'. Recensionen und Anzeigen (Tobias, *Grenzen der Philosophie;* Spir, *Denken u. Wirklichkeit;* Eucken, *Gesch. u. Krit. der Grundbegriffe der Gegenwart;* Pfleiderer, *Die Idee eines goldenen Zeitalters;* Spitta, *Die Schlaf u. Traumzustände der mensch. Seele;* Binz, *Ueber den Traum.* Literaturbericht (Sir A. Grant, *Aristoteles* (übers.), &c.). Bibliographie, &c. Heft 7. C. Schaarschmidt—'Zur Widerlegung des subjectiven Idealismus'. Recensionen u. Anzeigen (Cohen, *Kant's Begründung der Ethik;* Ueberhorst, *Die Entstehung der Gesichtswahrnehmung;* v. Stein, *Ueber Wahrnehmung;* Baeumker, *Des Aristoteles Lehre von den äussern u. inneren Sinnesvermögen;* Pivány, *Entstehungsgeschichte des Welt- u. Erdgebäudes u. der Organismen).* Bibliog.